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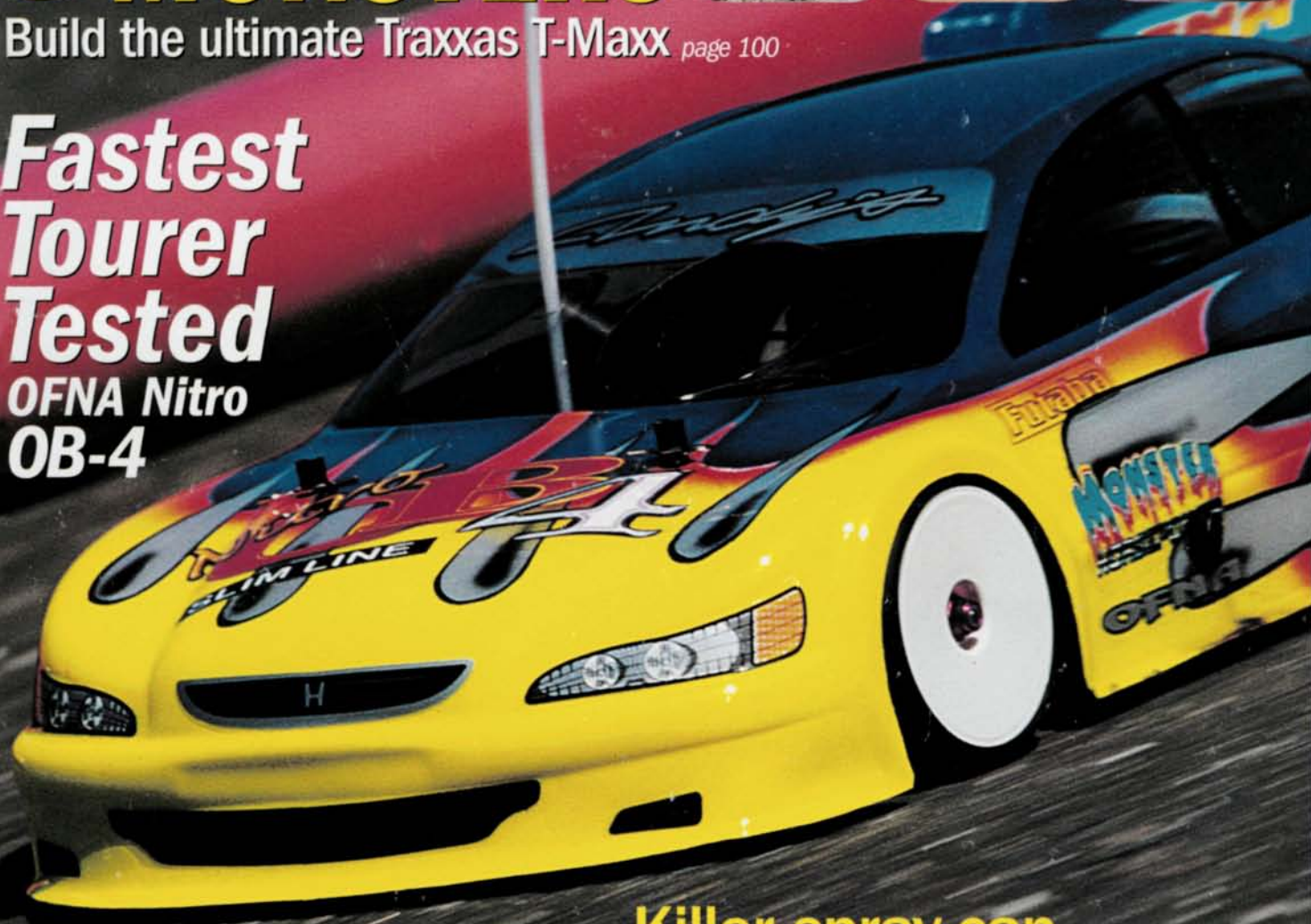
STREET



Build the ultimate Traxxas T-Maxx page 100

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contents

Volume 15 ■ Number 11 ■ November 2000

features



100

- 100 Triple Threat: the World's Wildest T-Maxxes**
Cruising, crushing and racing with the Traxxas T-Maxx
by Kevin Hetmanski, Steve Pond & Bob Hastings

- 115 HPI RS4 Hop-Ups Buyers' Guide**
Mods to make your RS4-series car lighter, faster, stronger, or just plain cooler
by the Staff of RC Car Action

- 142 ROAR On-Road Nats**
Baker and Blackstock invade Florida
by Derek Buono

- 158 How To: Paint "Tribal" Graphics**
A quick, new look from a can
by Bob Hastings



115



142

- 172 How To Fix Flameout**
... and other problems that occur when good engines go bad
by Peter Vieira



158

DEPARTMENTS

- 22 Starting Line
- 24 Readers Write
- 36 Readers' Rides
- 192 Product Watch
- 208 RC Car Action Info Source
- 217 Track Directory
- 224 Featured manufacturer and advertiser information

COLUMNS

- 31 Inside Scoop
by Chris Chianelli
- 44 Pit Tips
by Jim Newman
- 52 Troubleshooting
by Derek Buono
- 127 Racer News
by Greg Vogel and Derek Buono
- 164 4x4
by Kevin Hetmanski
- 176 Piston Power
by Chris Chianelli
- 180 New Kit News
by Bob Hastings
- 225 Chris's Back Lot
by Chris Chianelli

ON THE COVER Main image: the OFNA Nitro OB4—fastest tourer tested in *RC Touring Car*; (inset) Traxxas T-Maxx triple threat, courtesy of Hetmanski, Pond and Hastings. All photos by Walter Sidas.

track tests



- 62 OFNA Nitro OB4**
OFNA takes the pivot-ball plunge
by Greg Vogel



- 70 Tamiya TGX Mk.1 Rally**
Tamiya takes its big tourer off-road
by Paul Onorato



- 80 HPI RS4 Sport 2**
HPI delivers Pro 2 tech on a "sport" budget
by Kevin Meyer



- 88 Kyosho PureTen Alpha GP RTR**
Ready-to-run rally with nitro power
by Peter Vieira

Still RC crazy after all these years

I don't remember the exact date when I got my first RC kit, but my memories of cracking open that Kyosho Ultima box are as vivid as my memories of this morning's breakfast. I built that first kit more than 10 years ago, and I can't recollect a single day since then that I haven't worked on—or played with—an RC car.

Before I got my Ultima, I read *Radio Control Car Action* (of course!) and was enthralled by the thought of building a car of my own. I actually dreamed about opening the box and finding parts bags like the ones I had read about in *RC Car Action*. I was not disappointed when the Ultima's parts were at last spread out on my bench, which I had cleared off in anticipation of "RC day." Like any good RC guy, the first thing I did was to slip the tires onto the rims and hold them up next to the body. "Wow ... this thing is going to be big!" I thought (actually, I was so excited that I probably said it aloud—like Austin Powers, fresh from his cryogenic goo). Then I pored over the manual, savoring each step and wishing I didn't have to wait to get off work before I could start wrenching. I was late for work because I just couldn't leave until I had loaded batteries into my Futaba Magnum transmitter and made the servos move. Amazing!

My shift at "Child World" seemed interminable that day, but after I had stayed late to find the last Rambo action figure for a 5-year-old counterterrorist, I hightailed it back home to hit the bench. I can still recall every step: threading the tie rods, pouring the green shock oil into the plastic "Sport Shocks" (that was totally awesome), closing up the differential case and suddenly understanding how a diff works, trimming the body with a pair of scissors from the kitchen My memories are as crystal-clear as a Hi-8 video, even though it was more than a decade ago.

As a modeler during the last 10 years, I've built countless kits, attended trade shows, raced at the local track and seen (and covered) lots of races. I must be over RC by now, right? No way! I'm still as stoked by building and running RC cars as I was during the Bush administration. I still get a kick out of oil-filled shocks, I'm still amazed by how great the outside of a body looks when the paint is on the inside, and I still smile when I think about how I'm in complete control of a car that's way over there, even though I'm standing way over here. I sincerely hope you feel the same way about your hobby experience. Think back to the excitement you felt when you started. Still have it? Good. I wouldn't trade the last 10 years for anything; I only wish I had started younger. I have a feeling that in 10 more years, I'll be just as into it as I am now ...

—only more so.

Peter Vieira
Executive Editor



RADIO CONTROL car action

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Assistant Editors DEREK BUONO, KEVIN HETMANSKI,
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Small Spender

For about a month now, I have been grinding over whether to get a Triple-XT to replace my Double-XT 'CR,' but then I read your response to Scott Zinger's letter ("Too much tech too fast?") in the September 2000 issue. This led me to realize that even though I don't have the newest truck, I can still be competitive with my current truck. I think I'll hold on to it for a little while longer (until I get a job, a real car and an H.A.R.M. 1/5-scale car—big dreams, but hey, why not?). I just wanted to let you know that I appreciate the indirect help. You saved me at least \$150, and when you're on a budget, that's good. [email]
ADAM MORGAN

I don't think the Losi guys are too psyched that I cost them a sale, but I'm glad I made you feel better about your Double-XT. As for those big dreams ... keep on dreaming them. As expensive as a 1/5-scale car may seem to you, you'll be surprised at how quickly you can make things happen when you devote yourself 100 percent to a goal. I won't get all Anthony Robbins on you; all I'm saying is, "Go for it!"
—Pete

Speed Needs

I own an Associated B3 Sport buggy that I really enjoy. I run it with a 17-turn-quint mod motor, Novak Hammer ESC, Futaba radio gear and Sanyo 1700 batteries. The only problem is, I want more speed. I installed bearings and run it with a 23T pinion and 81 spur. Do you think I should try the DuraTrax

Maximum ST gas truck or a Bolink Sport 2000? How fast would they go? I know that on-road cars are faster, but how much faster? [email]
CHAD WHEELER

Actually, Chad, the Sport 2000 with your 17-turn mod motor and a 7-cell pack will be good for about 40mph (compared with about 30mph for the Maximum ST), and since you already have radio gear for it, you'll be going faster than ever for way less than \$100. You can run any "wide" body on the Sport chassis (there are three new NASCAR styles shown in this month's "Inside Scoop"), or you can get the narrow conversion kit (it's cheap) and run superspeedway bodies. You can't take a Sport 2000 off road, and you'll miss the sound of a nitro engine, but when it comes to setting neighborhood speed records, you'll be just about untouchable.
—Pete

Further Comments on Rewiring your ESC

We at Novak Electronics would like to offer some additional comments regarding the step-by-step article, "How to Rewire Your ESC" (August 2000).

In the "You'll Need" sidebar, you suggested that readers could upgrade the wires to "heavy-duty 12-gauge pipes." However, the only way to facilitate this change is to enlarge the plated through-hole in the speed control. You suggested using either a reamer or a drill bit to enlarge the holes in the PC board, but you did not tell readers that the hole in the PC board that the power

wire is soldered to is a plated through-hole that can connect one or more sides and/or layers of a PC board. A reamer or drill bit should never be used to clean out or enlarge a plated through-hole on a PC board for this very important reason: the plated through-hole can connect as many as four sides of a four-layer PC board.

At Novak Electronics, we use four-layer PC boards to give our customers the lowest possible on-resistance in the speed controls they buy from us. Drilling or reaming the PC board makes it impossible to connect the sides or layers of the PC board, and this can greatly reduce the speed control's efficiency or even make it inoperable. Drilling out or reaming the plated through-hole can ruin the speed control. This type of damage is not covered by warranty and cannot ever be repaired.

Step 4 of the article discusses the use of a desoldering bulb to remove solder from the hole in the PC board after the wires have been removed. Effective use of a desoldering bulb requires so much heat, however, that it can permanently damage the PC board. In our opinion, the desoldering tool mentioned in your article does not have enough suction force to remove all the solder from the holes. The best tool for this job is a purpose-built desoldering tool such as a Hako 470B. As an alternative, we advise readers to use 1/8-inch-wide desoldering braid in conjunction with a soldering iron to remove excess



solder. Regarding Step 5, readers should be instructed to tightly twist the wire before tinning it. If the wire is not twisted before it is

tinned, its diameter will increase from the application of solder, and it will not be possible to pass the wire through the hole in the PC board. In addition, we recommend stripping off 1/4 inch of the wire, rather than 1/8 inch, because it is easier to solder the wire to the PC board when you can heat the PC board and the wire at the same time. The solder will flow through the wire and the plated through-hole more easily, thereby yielding a lower-resistance connection. A pair of side cutters is then used to remove the excess wire.
Novak Electronics Inc.

Novak Electronics is expert in this area. Although innumerable hobbyists have successfully replaced their ESC's wires (and their experience was the basis for the article), not all have dealt with plated through-holes, and we appreciate Novak's clarification. We recommend that you review the points Novak has noted and consider allowing the original manufacturer of your ESC to handle any rewiring tasks. Novak has a dedicated service department to handle such jobs, and other manufacturers offer similar services (check your ESC's instructions or warranty card for details).
—Pete

YOU SAID IT

I'm 14 years old, and I just bought myself a Traxxas

Rustler for my birthday. I also bought a SuperBrain charger, two 6-cell 1800mAh stick packs and a 2-channel Futaba radio. The Rustler was so popular with Tower Hobbies that I had to back order mine, and it won't be here for half a month. I can't figure out what to do with myself until I get this car, which I have been saving up for almost three years. I have decided to torment my mom to try and get her to allow me to cut the yard in half, making it half yard and half track. So far, she has declined. While I am not tormenting my mom, I am looking at pictures of the Rustler online and in magazines. I have read *RC Car Action's* article on the ProTraxx version about 70 times, and it hasn't gotten any different. It's only been a day and a half since I ordered my car, and when the batteries get here before the car, it will only add to the torture. I'm not sure if I'm going to make it to the next month, and I don't even know why I'm writing this email except that I know you guys are cool, and I know you'll understand. Please feel free to print my email address.

TYLER FUNK (AKA "THE TFUNK") MTFunk@aol.com

"When the batteries get here before the car, it will only add to the torture."

Bud, we've all been there. Greg has agreed to kick down his tricked-out Rustler from the "Radical Rustlers" feature in the October 1998 issue. He even autographed a copy of the article for you (let's see; the magazine sold for \$4.95 in 1998, Greg signed it in 2000, so in about 5 years it should be worth, hmmm—about \$2). Be sure to email Greg and tell him how great he is.
—Pete



WRITE TO US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

EMAIL: ■ Derek Buono: derekb@airage.com ■ Chris Chianelli: chrisc@airage.com ■ Kevin Hetmansk: kevinh@airage.com ■ Steve Pond: stevep@airage.com
■ Peter Vieira: peterv@airage.com ■ Greg Vogel: gregv@airage.com



BY CHRIS
CHIANELLI

TOTALLY FACTORY TRINITY BRUSH FACTORY

have a feeling that the new Brush Factory may lead to a brush-cutting renaissance. Like Trinity's Magician, the Factory accepts standup and laydown brushes and allows you to adjust the height of the cutting wheel relative to the brush face. But the Brush Factory is easier to use, thanks to its freestanding design; the unit even features a brush serrator.

An included drive motor powers the serrator and cutting wheel via a set of pulleys (safely concealed when the unit is standing), so all you will need to cut brushes is a couple of Ni-Cds for power.

Trinity Products Inc., 36 Meridian Rd., Edison, NJ 08820; (732) 635-1600; fax (732) 635-1640; www.teamtrinity.com.



FAT FOAM Trinity T-Maxx tire inserts

Steve Pond just ran a set of the new Trinity foams in his Project Race Maxx, and he gave them a big thumbs-up (trust me; he's got some big thumbs). The dual-density foam inserts use firm blue foam for the outer rings to provide side-wall support, while the softer center

hoop allows the tire to conform to the ground. The blue and white rings must be glued together before installation, so pick up some Trinity Bomb glue when you're at the hobby shop. While you're at it, get some body clips; you know you need some.

Trinity Products Inc., 36 Meridian Rd., Edison, NJ 08820; (732) 635-1600; fax (732) 635-1640; www.teamtrinity.com.



ADD "COOL" TO YOUR T-MAXX Robinson Racing Products flywheel for Traxxas T-Maxx

Looks as if Rob Robinson has made a fresh pile of aluminum shavings over at the prototyping table. RRP's new vented flywheel for the Traxxas T-Maxx is a direct fit on the TRX-15 engine; it features the usual Robinson precision machining. The vents are designed to create a fan effect. I'm not sure whether they will actually cool the engine, but they will certainly add cool to your rig.

Robinson Racing Products, 4968 Meadow View Dr., Mariposa, CA 95338; (209) 966-2465; fax (209) 966-5937; www.robinsonracing.com.



PT CRUISIN' RC Cruiser body

BOLINK ALSO HAS A NEW "RC CRUISER" shell that's patterned after the hottest Chrysler since the Viper. The 190mm body is ready to drop onto any electric touring car (or nitro tourer, if you want to narrow it down from 200mm), and Bolink includes window masks and detail decals to help you style it out.

Bolink R/C Cars Inc., 420 Hosea Rd., Lawrenceville, GA 30045; (770) 963-0252; fax (770) 963-7334; www.bolink.com.



BOLINK GOES WIDE

IF YOU HAVE A BOLINK SPORT 2000, '91 Sport, Associated RC10L or another old-school "wide" pan car, then Bolink has some new NASCAR bodies for you. The 2000 Taurus, Monte Carlo and Pontiac shells will give your fatty some racing style, and if you're running on a flat oval, one of these wide-chassis bodies could be the hot setup (at the very least, you'll be more difficult to pass!).

Bolink R/C Cars Inc., 420 Hosea Rd., Lawrenceville, GA 30045; (770) 963-0252; fax (770) 963-7334; www.bolink.com.

NASCAR bodies for wide pan cars



Put away the hacksaws, kiddies; O.S. now offers the red-hot CV-R engine with a precut crank designed specifically for the Associated RC10GT and the Kyosho Ultima ST Type R. The engine includes the 10E-R



DROP-IN POWER O.S. CV-R for GT

rotary carburetor and all the latest CV features, including three larger ports, a larger crank and beefed-up crank bearings, machined-aluminum conrod, and more ... or less, as in less fuel residue on your chassis, thanks to a more tightly fitting crankshaft/bearing.

O.S. Engines; distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; (800) 982-8948; fax (217) 398-0008.

Dirt Devil DURATRAX NITRO DEMON

This big, scale-looking desert truck is the latest RTR from DuraTrax, and it's built on the 1/8-scale buggy platform of the Axis and Nitro Quake. The Nitro Demon brings some changes to the DuraTrax RTR formula; the radio is manufactured by Futaba. Otherwise, you're getting the usual DuraTrax good stuff, complete with catchy names: Torq 21 engine with chrome-plated brass sleeve; Dura-Seal sealed radio box; Fiberite II dual brake discs; Rapid-Tune shocks; Clean-Fill 125cc fuel tank; and of course, Stress-Tech molded parts that are guaranteed not to break during the first six months of use, or DuraTrax will replace them.

DuraTrax; distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; (800) 982-8948; fax (217) 398-0008; www.duratrax.com.



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FORCE-FED FIREBIRD HPI

The latest 200mm sedan shell from HPI should be a hit with all red-blooded muscle-car fans. The distinctive nostrils of Pontiac's Ram Air hood induction system are perfectly captured by the curvaceous shell, and HPI even includes two wings with the body: one "scale" and one "street," as in "extra big"—for that boy racer look. Like other HPI bodies, the Firebird includes a full set of decals, window masks, protective overspray film and body-post dimples for easy mounting.

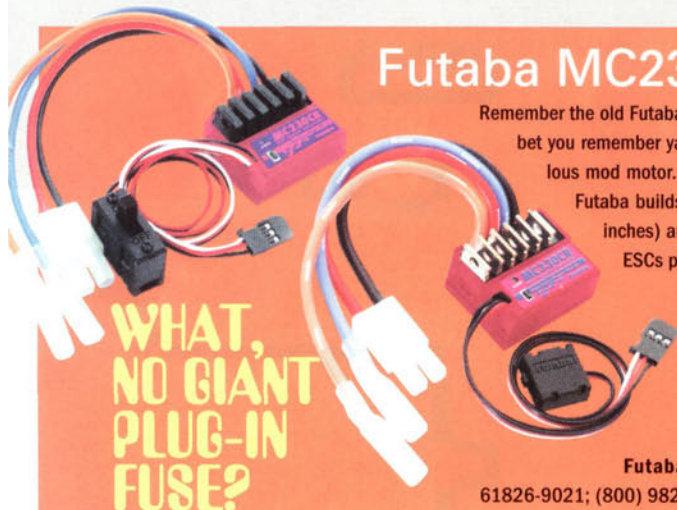
HPI, 15321 Barranca Pky., Irvine, CA 92618; (949) 753-1099; fax (949) 753-1098; www.hpiracing.com.



Pontiac Ram Air Firebird

Futaba MC230CR and MC330CR ESCs

Remember the old Futaba MC210CB reversing ESC? I bet a lot of you got started with one of those black bricks, and I bet you remember yanking out the big automotive fuse after it popped because you hooked it up to some ridiculous mod motor. That was then; this is now! The latest Futaba ESCs feature the same modern technology as Futaba builds into its radios. The MC230CR and heavy-duty MC330CR are compact (just 1.07x1.31x0.5 inches) and include Tamiya plugs and bullet connectors for easy installation. You can also get the new ESCs packaged with Futaba's 2PC Magnum and 2PCA Magnum Junior radios.



SPECS	MC230CR	MC330CR
Capacity	6 to 7 cells	6 to 7 cells
Motor limit	20-plus turns	13-plus turns
Wire (AWG)	16	14
Weight (grams)	44	45

Futaba; distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; (800) 982-8948; fax (217) 398-0008.

SHOCKING NEWS!

The Choice Of Matt Francis, Brian Kinwald
David Spashett, Josh Cyrul & Barry Baker

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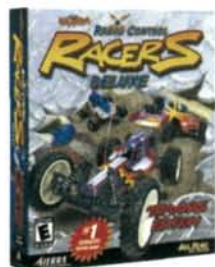
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TRAXXAS BOOTS UP 3D ULTRA RADIO CONTROL RACERS TRAXXAS EDITION PC DRIVING GAME

If you like Sierra software's "Radio Control Racers" game, you'll like it even more with authentic Traxxas vehicles. You can pilot a Traxxas Bandit or a Rustler (or a generic "baja bug" and monster truck) on a variety of fantasy tracks (14 in all) from the viewpoint of the drivers for authentic racing action (as long as your idea of "authentic racing" includes launching bottle rockets at competitors, "Soccer" and "Battle Ball" races, and power-ups!). The cars have accurate vehicle physics and, depending on game mode, can actually "wear out" and be improved with upgrades! You can even choose your own custom paint jobs for the cars. Check it out at www.nowthisisfun.com/rcracers.

Sierra On-Line Inc., 3060 139th Ave. SE, Ste. 500, Bellevue, WA 98005; (425) 649-9800; fax (425) 641-7617; www.sierra.com.



NITRO MT GETS RACER TREATMENT HPI Nitro MT Racer

If you planned to buy a Nitro MT and add a bunch of hop-ups to it, put away your wallet—at least, until the Racer version comes out. HPI's 4WD, shaft-driven truck will be offered with the following optional parts all in one box:



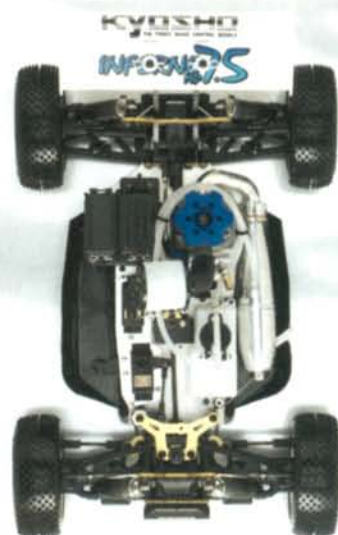
- Heavy-duty main chassis
- MIP CVDs
- Slipper clutch
- Tuned pipe
- Fiber brake disc
- Racing fuel tank
- Stainless-steel hinge pins with rear arm brace
- Steel turnbuckles
- Pro-Line Bow Tie tires
- Updated, stronger suspension arms

Even more stuff is included with the kit, but that's all I have space for!

You'll find Greg Vogel's complete review of Kyosho's latest Inferno in the next issue of *RC Nitro*; until then, this shot of his ready-to-race 7.5 will have to do. Notice the dual-chamber receiver/battery box, the splashguard over the front brake disc, Teflon-coated shocks, 3mm chassis with 8 degrees of kickup and—well, everything else. Looks as though Kyosho has a good shot at adding a fifth IFMAR Worlds title to the four consecutive wins it already has bragging rights to.

Kyosho; distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; (800) 982-8948; fax (217) 398-0008.

FIRESTARTER Kyosho Inferno MP7.5



HOT HOOPS Hobby-Tech wheels

Hmmm ... I think I found some wheels to go with that Firebird body! Hobby-Tech has some of the most authentic-looking sedan wheels going; no wonder, since all its designs (except for the dish rims) are licensed from American Racing, whose wheels appear on street machines all over the USA's hottest cruising spots. All the styles have a 12mm hex to fit touring cars, are 25.5mm wide with zero offset and are offered in black, white, silver and chrome.

Hobby-Tech, 1139 Coiner Ct., City of Industry, CA 91748; (888) 722-7101; fax (888) 843-0707; www.hobby-tech.com.

OFNA Wheels

From totally scale we go to totally groovy, with OFNA's candy-colored translucent rims. They're made of Lexan to be extra stiff, and the tinted, see-through look is nothing if not unique. The rims are economical, too; OFNA sells 'em in eight-packs at a bargain price.

OFNA Racing, 22692 Granite Way, Ste. B, Laguna Hills, CA 92653; (949) 586-2910; fax (949) 586-8812; www.ofna.com.



Win a \$500 gift certificate from DuraTrax! Send a sharp, uncluttered, well-exposed color photo of your vehicle (no Polaroids), and a brief description, to Readers' Rides, RC Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. If we publish your photo, you'll receive a free RC Car Action decal sheet and will be eligible to win a \$500 gift certificate from DuraTrax in the "Readers' Rides of the Year Contest." Write your address and phone number on your letter and on the back of every photo you send. Good luck!

Readers' Rides

Eduardo Piovani Dias, Campinas, SP Brazil Yokomo MR4-TC

This Brazilian touring car has a Trinity D4 12-turn motor, Futaba 9403 servo, Tekin G12 CIII ESC, Yokomo hard inserts and Tamiya springs—all topped off by an Andy's Dodge Stratus shell. Eduardo uses an Airtronics M8 radio for control.



Jason Jenson, St. Louis, MO Traxxas T-Maxx

Equipped with a Bigfoot body, this T-Maxx has a Hitec steering servo, an MIP temp gauge, front and rear aluminum skidplates and a graphite brake disc. Jason plans to add more hop-ups.



Helge Wyrowski, Heide, Germany Kyosho Go-Kart

This Kyosho go-kart has an extra personal touch. Helge went to the lengths of covering the steering wheel with leather and sewing a cotton suit for the driver. The 1/4-scale racer is set up with a Sanwa radio and Hitec 605 BB servos, rubber front tires and rear foams (for better handling) and a tuned pipe for true performance.



Josh Gartman, Faberg, Norway Serpent, Kyosho, OFNA, FG and Traxxas vehicles

Josh has quite a fleet of RC vehicles; in 1/10 scale are the Serpent Impact M2 BMW and the Traxxas Nitro Stampede. An OFNA Ultra Worlds GT and a Kyosho Landmax Repsol Escort balance out his 1/8-scale vehicles. The nitro burners are dwarfed by the 1/5-scale FG Viper GTS-R. Josh uses Futaba radio gear in all of the vehicles.

sponsored by

DURATRAX

Readers' Rides

Michael Bergman, Auburn, CA Team Associated TC-3

This California cruiser features a Novak Cyclone speed control, an Orion V/Max 2000mAh battery, a P2k motor and an Airtronics servo. Michael uses an Airtronics M-8 servo to guide his touring car.



Robert Denson Jr., West Memphis, AR Homebuilt John Deere

Most of this John Deere model—including the motor and transmission—was scratch-built. Robert invested 500 hours over two years to complete the project. The amazing plywood, balsa, Plexiglas and brass replica features steerable rear wheels, an auger that can be unloaded, a header that can be raised and lowered, hydraulic hoses, turn cylinders and a completely detailed cab with controls and field lights. The wheels, speed controller and radio gear are the only store-bought parts.



Don Meszaros, St. Augustine, FL Team Associated RC10 Dual Sport Superbird

This Team Associated racer is Don's first RC car; it has a Reedy 12-turn motor, a Hitec Lynx FM radio and an F1 Bullet speed control. The vintage body is from Bolink with custom paint by Don.



Daniel Guthrie, Tomah, WI Traxxas T-Maxx

Though the T-Maxx impressed Daniel right out of the box, he added a few hop-ups to increase the fun and dress it up, too. Among the additions are a Hitec high-torque steering servo, a New Era steel roll bar, Traxxas Big Bore shocks and a Robinson steel spur gear. GPM Racing provided the shock towers, hex drive adapters and steering blocks.



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DURATRAX

Pit Tips

BY JIM NEWMAN

WIN AN OFNA Z-10 RALLY! Radio Control Car Action will give a 6-month subscription (or extend an existing subscription) to the author of each idea used in "Pit Tips." "Top Tip" winners receive an OFNA Z-10 Rally kit. All published "Pit Tip" authors receive an OFNA yo-yo. Send a rough sketch to Jim Newman, c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one nor return unused material.



Power Indicator

We've all left our receiver batteries switched on accidentally. If you paint a bright color on the recessed portion of the power switch, you'll be able to tell at a glance what position the switch is in.

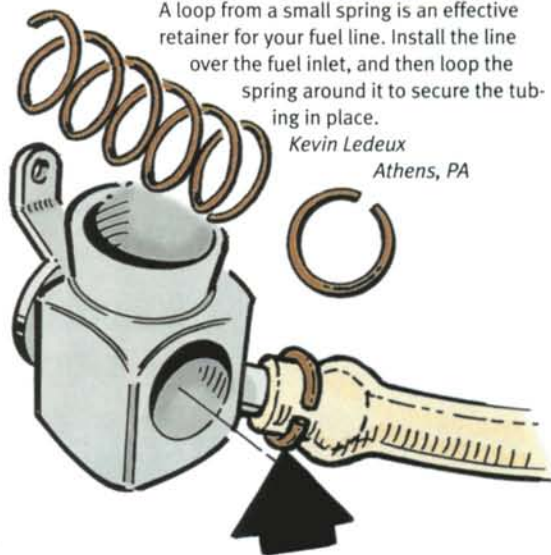
Steve Selpats
Corning, NY



Fuel-Line Clamp

A loop from a small spring is an effective retainer for your fuel line. Install the line over the fuel inlet, and then loop the spring around it to secure the tubing in place.

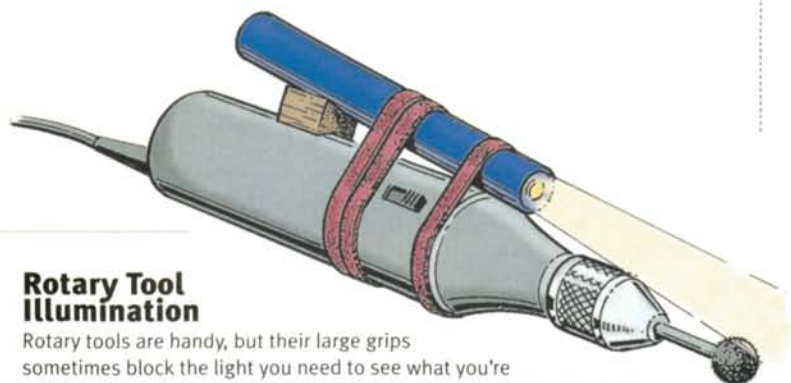
Kevin Ledoux
Athens, PA



Rotary Tool Illumination

Rotary tools are handy, but their large grips sometimes block the light you need to see what you're working on. Tape a small penlight to the top of your rotary tool to light up the piece.

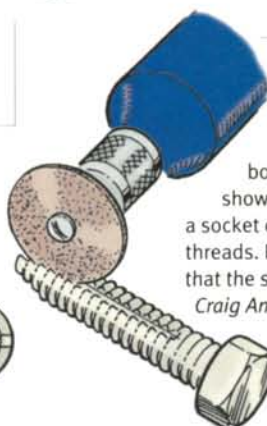
Derek Robinson
Springfield, MA



Simple Screw-Hole Tap

If you find a particular screw difficult to install, tap the hole first by slotting a bolt that has threads of the same size, as shown. Run the slotted bolt into the hole with a socket driver or a nut driver to clean and tap the threads. Remove the slotted bolt, and you'll find that the screw will be much easier to install.

Craig Andersen
Billings, MT



Post-run Preventive Maintenance

A clean engine will run at a lower temperature than one that's varnished with fuel residue. After you've finished running for the day, use a pipe cleaner to remove any build-up that's between the head fins.

Mitchell Hicks
Redford, MI



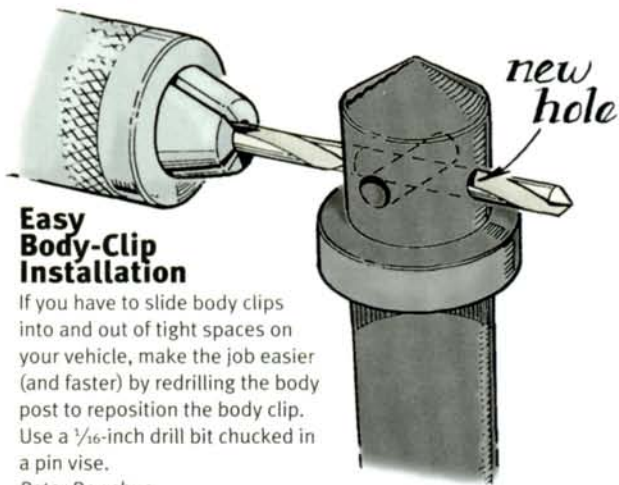
TOP TIP

Pit Tips

Easy Body-Clip Installation

If you have to slide body clips into and out of tight spaces on your vehicle, make the job easier (and faster) by redrilling the body post to reposition the body clip. Use a $\frac{1}{16}$ -inch drill bit chucked in a pin vise.

Peter Donahue
Bay City, MI



Extra Spray-Paint Capacity

It's inconvenient to stop in the middle of painting a body to reload your air-brush. Increase paint capacity by making use of an empty 35mm film canister: drill the lid to accommodate the air-brush pick-up, and snap the paint-filled container into place.

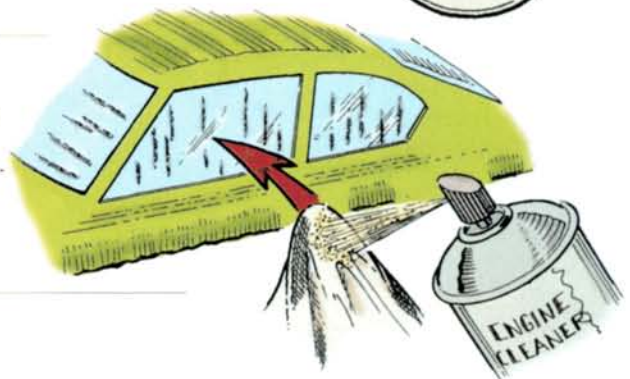
Gerry Noward
Trumbull, CT



Adhesive Removal

Spray a little nitro-engine cleaner onto a paper towel, and then use it to remove masking residue. This cleaner can affect the painted surfaces, so don't spray it directly onto the body.

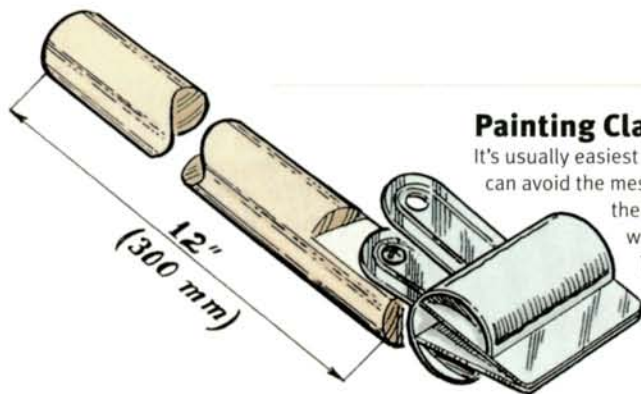
Paul Digler
Spokane, WA



Painting Clamp

It's usually easiest to hold car bodies and other items in your hand for spray painting, but you can avoid the mess by attaching an alligator clip or a document clip to a dowel and holding the part in that; you'll easily be able to manipulate the part you're painting without spraying your hand.

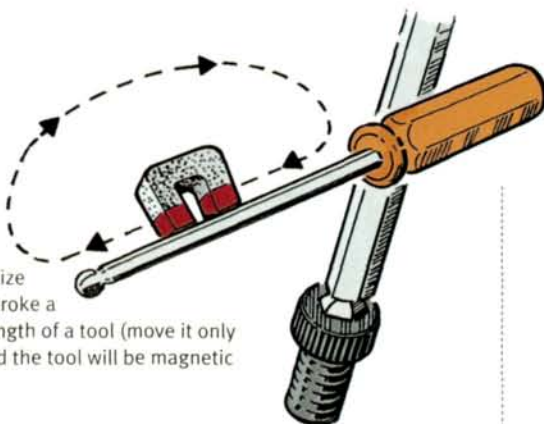
Thad Lenker
Medford, OR



Magnetic Tools

To make it easier to install fasteners in tight places, magnetize your tools. Simply stroke a magnet along the length of a tool (move it only in one direction), and the tool will be magnetic for weeks.

Pat Kehoe
Brewster, NY



Off-Road Detail

Dress up your off-road truck with authentic-looking headlamp guards and grill openings. Cut pieces from a screen-door repair kit to fit the body parts, paint them a contrasting color and use Shoe-Goo to fix them in place.

Steven Calabro
Detroit, MI



Troubleshooting

BY DEREK BUONO • ILLUSTRATIONS BY JIM NEWMAN

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at *Radio Control Car Action*, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to *Troubleshooting, Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.

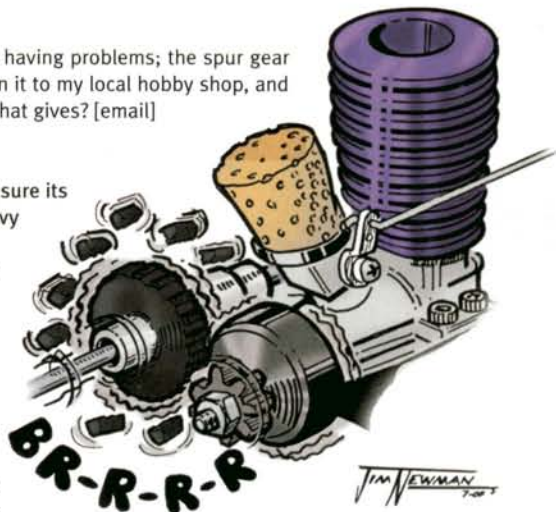
Landmax Gear Trouble

Since replacing my Kyosho Landmax's stock clutch with a heavy-duty clutch, I have been having problems; the spur gear strips very quickly. I'm using about a half a tank of gas before I strip the gear. I have taken it to my local hobby shop, and they say the gear mesh is fine, but I noticed the engine flexes when I apply the throttle. What gives? [email]

JAMES CARRILLO

The Landmax uses a plastic spur gear that must mesh perfectly with the clutch bell to ensure its longevity. But even when the gear mesh has been set perfectly, the combination of a heavy 1/8-scale chassis, a powerful .21 engine and the heavy-duty clutch means that a plastic gear really doesn't stand a chance of surviving for extended periods. It should, however, last longer than half a tank's worth of running, and that brings me to your "engine flex" problem. I'm certain that your throttle endpoints are set improperly, and the throttle servo is actually twisting the chassis as it tries to pull the engine off its mounts. This opens up the clutch bell/spur-gear mesh at full throttle (exactly when you need perfect mesh), and before you know it, that spur gear is stripping like a nudist in July.

First things first: set the endpoint adjustments on the radio so you can go from full throttle to full brake without tweaking the engine and altering the gear mesh. If your radio doesn't have endpoint adjustments, get some Du-Bro spring hardware to allow the linkage to extend past the stop on the carb (your local shop can help you set it up). Your next plastic gear will last much longer, but I suggest you stop buying them and spring for Kyosho's hardened-steel spur gear instead. It's more expensive compared with one plastic gear, but it will outlast 10 plastic ones, so you'll actually save money. Also, if you don't already have the hardened clutch bell, I would put one of those on your list of must-haves, too. The steel-on-steel combo will give you maximum longevity.



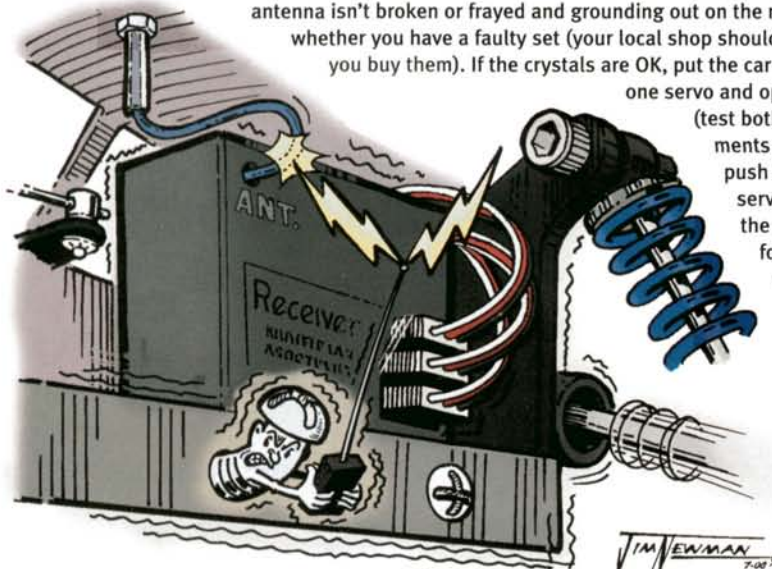
Engine Noise

My OFNA Pirate RS, with a Futaba 3PJ FM radio, goes out of control when I apply the throttle. What could be causing this problem? [email]

JOE

Gas cars have some special problems when it comes to radio interference, but first, I'll narrow down some simple solutions. Check your receiver pack to make sure it's fully charged or has fresh batteries, and make sure the antenna isn't broken or frayed and grounding out on the metal chassis. Next, install new crystals to see whether you have a faulty set (your local shop should be willing to plug a set into your gear before you buy them). If the crystals are OK, put the car on a stand, and with the engine running, unplug

one servo and operate the other to see whether one is defective (test both servos). Also make sure the endpoint adjustments are set so that the servos aren't straining to push the linkages past their limits; this will cause the servos to pull much more current, and it might cause the receiver to glitch. If the problem persists, look for loose parts. Have you ever noticed that when you put the igniter on the plug or touch the engine with a screwdriver that the servos sometimes glitch like crazy? The same thing can happen if a steel washer is dancing around on a loose screw, the clutch bell is rubbing the flywheel, or the manifold and pipe are rubbing in the coupler, or if there is any other metal-on-metal vibration. Check all the car's screws for tightness, and apply thread-lock to any that are loose. If you eliminate all these possibilities, your car should be glitch-free.



Troubleshooting

Broken Jump Truck

I am into jumping my truck like you guys did in the August issue. My problem is with my Stampede; I have been stripping spur gears like crazy. Help! [email]

BECKY BLANCHARD



Just as we mentioned in the article, you must beef up your truck to take the added abuse of high-force landings. When a vehicle lands from any height, there is a huge shock to the drive train, especially when it comes down on power. To add life to the gears, remember to let off the throttle when landing, but for the most protection, loosen your slipper clutch (unless your Stampede is a few years old, it has a slipper). Set the clutch so the tranny slips for about 1 or 2 feet when you launch the truck at full throttle on a high-traction surface. If the slipper is set too tightly, it won't let the gear slip when overloaded, and if the gear can't slip, it will strip. For ultimate toughness, consider replacing your 48-pitch gears with a set of 32-pitch gears because the chunky teeth can take some heavy-duty abuse. Check with "Troubleshooting"'s sponsor, Robinson Racing, for the gears you need. RRP can be reached at (209) 966-2465 or at its website, www.robinsonracing.com.

Unequaled Precision

Absolute Series Spurs



Available in 48P in 80T thru 91T, this is the quietest spur you can buy!
RRP 1780 - RRP 1791

B3 / T3 Lite Aluminum Outdrives



Blue anodized and 40% lighter than stock ball diff outdrives.
RRP 1502

Absolute Series Pinons



Available in 48P in 16T thru 28T sizes. Super hard, lightened and cut unmatched precision. Great with any spur, but with an Absolute spur, even on-off noise is gone!
RRP 1416 - RRP 1428.

Unsurpassed Reliability

Outstanding Performance

Associated Blue Lightened Slipper Kit



The rear plate is hard anodized to reduce wear and the front plate is color treated. The front plate is designed to hold the slipper pad forcing the pad to slip on the rear plate. When pad shows sign of wear just flip it over for a new surface. Metal parts are CNC machined for a flawless fit. RRP 1515

RC10-GT Gas Spurs



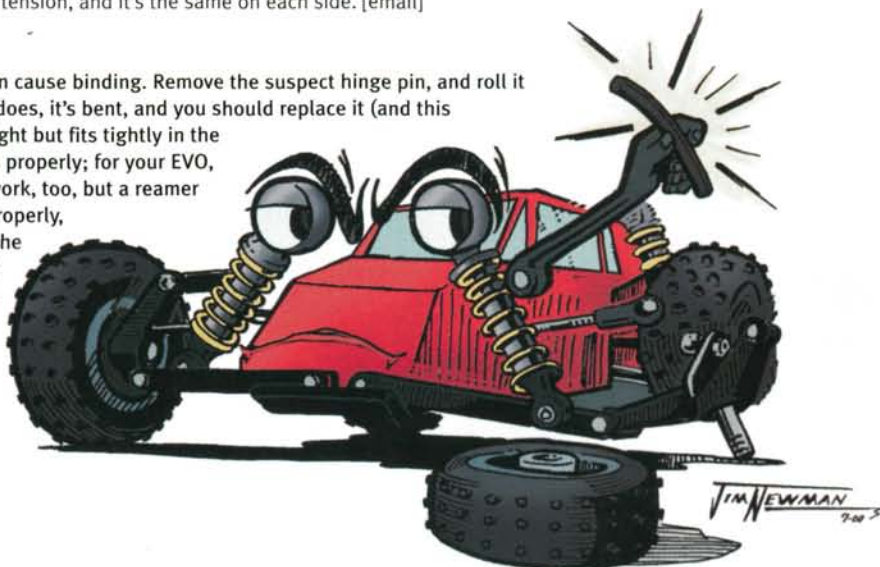
Super tough and precision machined from heat-resistant plastic, these spurs mesh flawlessly with our Clutch Belts. 32P spurs in 54T thru 67T, RRP 2261 - RRP 2267, and 32P bells in 14T (New) thru 24T, RRP 2214 - RRP 2224.

Binding Suspension

While working on my Schumacher Fireblade EVO, I noticed the suspension was binding up front on one side, but all the parts looked OK. I checked the spring tension, and it's the same on each side. [email]

DAVID WAGNER

Check the hinge pins first. Even a slight bend can cause binding. Remove the suspect hinge pin, and roll it on a flat surface; it shouldn't wobble at all. If it does, it's bent, and you should replace it (and this will solve your problem). If the hinge pin is straight but fits tightly in the arm or arm mounts, ream the parts so that it fits properly; for your EVO, you'll need a 3mm reamer (a 3mm drill bit will work, too, but a reamer is better). If the hinge pins are straight and fit properly, the next possible culprit could be the shock on the binding arm. It might have a bent shaft (check it with the rolling technique) or perhaps you over-filled it with damping fluid. You should be able to compress the shock fully without noticing a change in resistance throughout its range of travel. If the shocks and hinge pins check out, you shouldn't have any more binding. ■



Superb Quality

RC10-GT Steel Combo



Precision machined one-at-a-time from a single piece of steel and then hardened this 65T spur and 15T bell combo will last and last. The extra-hardened clutch bell fits ALL Associated and MIP shoes. RRP 2365

Associated Titanium Stealth Top Shaft



CNC Machined from a single piece of titanium, this super hard, super light top shaft will fit any Stealth transmission. No serious racer should do without this part. RRP 1512.

Intelligent Innovation

RC10-GT Hardened Steel Idler Gear



Cut from solid steel stock, this gear is lightened and then hardened for super quiet precision and extra long life. Jamin' tranny grease is included. RRP 2213

Thoughtful Design



1999 World Cup and National Champion

"I only care about performance, and that's why I run Robinson Racing gears and slipper clutches exclusively."

— Richard Saxton

RC10-GT Hardened Diff Gear



Hard anodized, precision machined aluminum diff gear. RRP 1513



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**TRACK
TEST**
1/10-SCALE NITRO

OFNA Nitro OB4

OFNA takes the pivot-ball plunge by Greg Vogel



PHOTOS BY WALTER SIDAS



With the recent surge in popularity of nitro sedan racing, we've seen quite a few new cars modeled after $\frac{1}{8}$ -scale on-road racecars. Eighth-scale racers are known to be the most dialed cars on asphalt tracks, so why not borrow their pivot-ball suspended steering knuckles and hubs, narrow chassis and multiple-disc brake systems and then scale it down to $\frac{1}{10}$ touring-car use? On the heels of Serpent and Mugen, OFNA* is the latest to take the on-road approach with a nitro touring car. OFNA's Nitro OB4 has some unique features that separate it from the pack, including a graphite upper deck and shock towers, smooth-edged CNC'd chassis and a bunch of in-the-box setup items to help dial the Nitro OB4 into your local track. Let's check out what else this car has to offer.

DATA CENTER

VEHICLE TYPE $\frac{1}{10}$ -scale, nitro-powered 4WD touring sedan
BEST BUYER Intermediate drivers or serious racers looking for a race-worthy sedan

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Good
Parts fit/finish Good
Durability Good
Overall performance Very good

SPECIFICATIONS

SCALE $\frac{1}{10}$
STREET PRICE \$269.99

DIMENSIONS
Wheelbase 10 in. (254mm)
Width 7.87 in. (200mm)

WEIGHT
Total, as tested 56.8 oz. (1,610g)

CHASSIS
Type Double-deck
Material 3.25mm aluminum/2.5mm graphite

DRIVE TRAIN
Type 3-belt 4WD
Transmission 2-speed centrifugal
Drive shafts (F/R) Constant velocity axles (CVAs)
Clutch 2-shoe
Brake Dual carbon-fiber disc
Differential(s) 4-gear bevel
Bearing type Rubber-sealed ball bearings
Final drive ratio First gear—7.03:1; second gear—4.98:1

SUSPENSION
Type (F/R) Double A-arm/H-arm with adjustable upper link
Damping Threaded oil-filled coil-over shocks

WHEELS
Type One-piece plastic
Width 2 in.

TIRES
Type Rubber slicks/belted slicks

ENGINE AND ACCESSORIES
Engine Trinity/Picco .12*
Carburetor Rotary*
Pipe Aluminum
Manifold Aluminum
 *Not included

LIKES

- Graphite upper deck and shock towers are stiffer than plastic.
- Threaded shock bodies allow easy, precise preload adjustments.
- Excellent handling characteristics.

DISLIKES

- Flathead engine mounting screws that fit flush in the countersunk holes would have been preferred.
- "Zipping" shocks need more finish work.
- Servo wires will drag on the pavement if you aren't careful with their routing.

TRACK TEST OFNA Nitro OB4



Above: pivoting steering knuckles allow you to adjust the front track and camber. OFNA's CVA (constant velocity axle) universals are stock front and rear. Right: the rear hub may look bulky, but standard rims fit with no problem. The threaded shock bodies are a nice touch.



building & setup tips

The Nitro OB4's manual lets an experienced builder complete the kit with relative ease, but first-time nitro builders have to concentrate a little more. A good tip for all builders is this: buy a good set of callipers. Callipers will help you set the pivot-ball suspension equally on both sides, and they come in handy for countless other tasks (such as measuring suspension spring-wire diameters, swaybar thicknesses, ride height, etc.). Here are some extra steps I took during the assembly process:

Differential assembly. The diffs leaked a little when I ran the car. OFNA has already received a few reports about the problem and is working to ensure that it no longer happens. To solve the immediate problem, I stacked two gaskets to better seal the front diff (the manual calls for just one) and enjoyed the added benefit of a smoother diff. The extra gasket spaces out the gears just slightly, and this frees up the diff action.

Tire inserts. Two full sets of tires are included and are great for racing, but the soft foam liner strips don't offer enough support. Pick up some hard, molded inserts, and ditch the foam strips.

Engine mounting. The Nitro OB4 includes a flywheel with a 5mm opening, but the Picco's 5mm crankshaft steps up to 6mm and requires the flywheel opening to be countersunk. I used a drill press to open up the hole and set the drill's depth gauge so that it wouldn't bore all the way through. See the October issue's "Hot Mod How To" in "Racer News" for a step-by-step look at this mod.

Setup. To get the car dialed in for our test track, I pulled off the torsion bars and put 40WT oil in the front and 35WT in the rear. I used the supplied belted tires with Pro-Line hard inserts.

YOU'LL NEED ■ 2-channel radio system with receiver ■ Steering servo (high torque/high speed recommended) ■ Throttle servo ■ Fuel ■ Glow-plug igniter ■ Polycarbonate-compatible paint ■ Tire glue ■ Thread-locking compound

FEATURES

• **Chassis.** Although we call it the "Nitro OB4," OFNA's complete name for this car is the "Nitro OB4 Slim Line," which refers to its super narrow chassis. Yes, it is narrow, but more important, it's 3mm thick and hard-anodized. The anodizing makes it tough to scuff the chassis, so the occasional bottom-out won't whittle away your chassis too quickly. Several openings in the chassis reduce its overall weight; all screw holes have been countersunk, and there are recessed slots for the engine-mounting screws. But these screws and their washers peek out from the bottom of the chassis; it would have been nice to see flat Allen-head engine-mounting screws so that the bottom of the chassis would have been perfectly flat.

The Nitro OB4's upper deck is constructed of woven carbon fiber, which is preferred over the plastic decks found in other similar cars. The Nitro OB4's vital components are suspended from the deck, and you can remove the entire assembly. This makes it easy to maintain the Nitro OB4.



The Nitro OB4 comes with a 2-speed tranny as standard equipment. OFNA also supplies two sets of gears: one for racing, the other for speed runs. A plastic pulley-shaft guide is bearing-supported, and there is a built-in belt tensioner.

• **Drive train.** The Nitro OB4's 3-belt drive system is typical for a nitro tourer and features sealed gear differentials. OFNA scored major points in my book by supplying fluid to fill the diffs. The diffs are a little tricky to assemble; you definitely need needle-nose pliers to install the hardware. When I had fin-



ished the diffs, the rear unit operated smoothly, but the front had some problems; it leaked slightly and had a notchy feel that required a little creative rebuilding to fix (see "Building & Setup Tips"). A 2-speed transmission is standard equipment, and OFNA supplies two sets of gears for it: a close-ratio setup for racing and a taller set of gears for speed freaks who just want to go fast. Ball bear-

ings support all of the drive components, and a plastic support ties the two center shafts together and has a ball-bearing tensioner for the side belt.

• **Suspension.** OFNA has equipped the Nitro OB4 with a highly tunable suspension system. Thick A-arms hinged to the center bulkheads extend to the steering knuckles and are attached by pivot balls. By adjusting the pivot balls up front, you can make camber and small track adjustments. The steering system has adjustable turnbuckles and a Kimbrough* servo saver. In the rear, there is also a double pivot-ball setup, but the pivots are on the bottom of the H-arm. This means that you can make toe adjustments without replacing the hub or arm carrier. An adjustable upper tie-rod has several possible mounting locations on the shock tower and hub and allows for easy camber adjustments.

I was happy to see that the oil-filled coil-over shocks are threaded, as this makes preload fine-tuning so much easier; however, the shocks' insides seemed to be threaded, too. Machine marks in the shock bodies caused the pistons to make a "zipping" sound as I compressed the shocks. Does the zipping noise make a difference on the track? Probably not, since the shocks don't hang up or bind at all, but I'd feel more confident if their shocks felt completely smooth.

• **Engine and accessories.** Since OFNA leaves the engine selection to the buyer, I dropped in a Trinity/Picco*.12 and installed the included header and tuned pipe to the engine with the supplied hardware. The engine is fed by a 75cc fuel tank with flip-top lid, and the tank features an in-tank fuel filter and lid-mounted pressure nipple. The Nitro OB4's clutch is a 3-shoe setup, which I had to modify to fit the Picco engine (see "Building & Setup Tips"), and screw-on pinion gears make it easy to change the 2-speed tranny's gear ratios.

Trinity/Picco .12 engine

When we tested the Nitro OB4 in the Fall 2000 "Touring Cars" special issue "Nitro Touring Shootout" feature, we installed a Trinity/Picco engine in the car and hit a top speed of 57mph—impressive; so, of course, I dropped in another Picco.

Trinity Monster Horsepower fuel

I filled the Nitro OB4's tank with Trinity's 20-percent fuel. I've gone through a couple of cases of the fuel already and found it very consistent. I rarely have to make a needle adjustment when I switch to a new jug.

Futaba 3PDF radio system

The 3PDF is one step down from Futaba's* flagship radio, the 3PJ; however, it's still packed with features. You can set throttle and steering exponentials and endpoints, and its multiple-model memory make it an excellent buy.

Futaba S9450 Digital steering servo

For quick, precise steering, I bolted in a Futaba Digital servo. The 9450 has more than enough torque and speed for any 1/10 car, and the servo performed with predictable perfection.

Futaba S148 throttle servo

After seeing which steering servo I chose, you might wonder why I chose a mere "standard" servo for the throttle. Well, I find that the S148 reacts quickly enough to work the throttle, and it has enough torque to slow the car. It's also inexpensive, and just about every racer who runs Futaba gear has a few S148s (or S3003s) just sitting on the shelf. Don't be a servo snob! You can put them to work.

Dynamite receiver pack

The car requires a 5-cell side-by-side pack, although, with some cutting, you could install other packs. I went with a 5-cell pack from Dynamite* to power the radio system. This pack lasts an hour-long Main without a problem.

THE COMPETITION*

	Drive train	Bearings	Diff's	Shocks	Engine**	Street price†	Reviewed
HPI Nitro RS4 Racer 2	3-belt	Yes	Gear	Aluminum	-	\$275	-
Mugen MTX-2	3-belt	Yes	Gear	Aluminum	MT12	\$475	4/00
OFNA Nitro OB4	3-belt	Yes	Gear	Aluminum	-	\$269	11/00
Serpent Impulse	3-belt	Yes	Gear	Plastic	Mega	\$295	1/00
Yokomo GT4	3-belt	Yes	Gear	Plastic	-	\$319	12/00

*Cars listed alphabetically by brand; **PS—pull start; ES—electric start; †approximate; price varies with dealer.

TRACK TEST OFNA Nitro OB4

• **Body, wheels and tires.** A great-looking Andy's 200mm Accord body is packaged with the Nitro OB4. OFNA supplies not one but two sets of tires and rims for the car, belted and unbelted, both with sticky, soft-compound rubber. Lexan, split-spoke rims and tire inserts are also included, but the tire inserts are simple strips of foam, and not as nice as the rest of the tire and rim package; I suggest you get shaped inserts.

PERFORMANCE

After spending some setup time on a Hudy tweak board and running a few tanks of fuel through the engine for break-in, I made a quick trip to the parking lot to get a general feel for the Nitro OB4 before I hit the track. I was surprised to find the car just wasn't hooking up. The OB4 lost its rear end as soon as it hit the apex of a turn, and it spun every time. Since it spun out just as readily when turning right or left, I knew it wasn't tweaked, so back to the pits I went for damping and spring-rate changes. I installed OFNA yellow springs in the front and blue in the rear. I also yanked the torsion bars off because I felt they were hampering the car's performance.

On the track, the car handled much better, and I was able to lay down some quick laps without looping it, but I felt I could get more out of the Nitro OB4.

I mounted a set of Pro-Line* H13 compound tires on Velocity rims with medium inserts, dialed in a little more toe-out in the front and added about 1/2 degree of toe to the rear. After that the car handled extremely well, but the shift point wasn't right: the car hit second a few feet before I had to brake for the end of the sweeper, and this caused a burst of speed and made the car overshoot the turn. Unfortunately, the tranny was already shifting as



OB4 fastest!

If you want to see how the Nitro OB4 fares against the Mugen MTX-2, Serpent Impulse, Nitro RS4 Racer 2 and the rest of the best competition nitro tourers, check out the latest issue of *Radio Control Touring Cars*. In our seven-car shootout, the Nitro OB4 had the fastest top speed with a blistering 57.51mph run (using the included "speed" gear set, of course).

quickly as it could, so my only options were to lock out second and wind out the engine, or swap to a single-speed tranny with a better overall ratio, which is what I plan to do; but for now, the 2-speed setup would be perfect on a larger track.

THE VERDICT

OFNA's Nitro OB4 is a well-sorted-out design that responds well to a little suspension tuning; the kit's suggested setup isn't the hot one, but the car can perform very well with just a little tuning. Hardcore racers should find the Nitro OB4 to be as capable as the Mugen and Serpent cars, and it is certainly OFNA's best effort to date. The kit provides great value with its two sets of gears, two full sets of tires and a cool pit bag. If you're looking for a car to fool around with as well as race, the Nitro OB4 might be just what you're looking for.

*Addresses are listed alphabetically in "Featured Manufacturers" on page 224. ■

HobbyTown USA®

Where Hobbies Begin!™

Nitro Power 7.2V 1400mAh Battery Pack

HTU Price
\$17.99
Reg. \$25.99
NTPR72



Availability and Participation May Vary. See Store for Details. Not Valid With Other Discounts, Coupons, Offers, or "Our Price" Sale Items. Coupon Must Be Presented To Receive Discount. Limit One Coupon Per Person. Expires 11/30/00.

Traxxas Nitro Sport Ready-to-Run

HTU Price
\$234.99
Reg. \$430.00
TRA4510



Availability and Participation May Vary. See Store for Details. Not Valid With Other Discounts, Coupons, Offers, or "Our Price" Sale Items. Coupon Must Be Presented To Receive Discount. Limit One Coupon Per Person. Expires 11/30/00.

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Mobile, AL (334) 633-8446	Overland Pk. KS (913) 649-7979	Mentor, OH (440) 946-5588
Gilbert, AZ (602) 892-0405	Wichita, KS (316) 683-7222	Southpoint, OH (440) 846-1770
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Orlando Bch., FL (904) 672-5441	Boone, NC (828) 265-3367	Austin, TX-North (512) 246-8904
Tallahassee, FL (850) 671-2030	Charlotte, NC (704) 544-2303	Lewisville, TX (214) 488-0880
Augusta, GA (706) 855-5003	Raleigh, NC (919) 790-5324	Fort Worth, TX (817) 263-1196
Columbus, GA (706) 660-1793	Wilmington, NC (910) 256-0902	Plano, TX (972) 758-7875
Kennesaw, GA (770) 426-8800	Winston-Sal., NC (336) 774-2324	San Antonio, TX (210) 829-8697
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Macheson Pk., IL (815) 282-0727	Rio Rancho, NM (505) 994-8874	Green Bay, WI (920) 490-9996
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Evansville, IN (317) 477-7200	Albany, NY (518) 435-9961	Sheboygan, WI (920) 452-0801
Indianapolis, IN (317) 845-4106	Amherst, NY (716) 833-7700	Cross Lanes, WV (304) 776-7259
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**TRACK
TEST**
1/8-SCALE NITRO



Tamiya TGX Mk.1 Rally

Tamiya takes its big tourer off-road by Paul Onorato

Tamiya's TGX-Mk.1 was one of its first "super"-size cars (although Tamiya simply refers to the chassis as "1/8 scale"), and few would argue that it is the best of the breed when it comes to durability, ease of assembly and maintenance, and scale realism (if you want to bring bodies into it; and when talking Tamiya, you should). Thanks to its enclosed shaft drive, sealed radio box and aforementioned toughness, the robust TGX was a natural for rally duty, so it made sense when Tamiya announced that a rally model was on the way. Not content simply to slap on some block-tread tires and a rally body, Tamiya outfitted the TGX Mk.1 chassis with new features that offer even greater protection for the electronics and running gear, and the result is a big, fun car that can go just about anywhere without completely giving up road handling. See for yourself.



We parked a 1/10 Kyosho Alpha RTR (also reviewed in this issue) next to the TGX to show scale. The bigger TGX's extra heft and ground clearance help it handle better off-road.



DATA CENTER

VEHICLE TYPE 1/8 nitro, 4WD rally car

BEST BUYER Enthusiast looking for a scale 4WD car with multi-terrain capabilities

KIT RATINGS (poor, satisfactory, good, very good, excellent)

Instructions Very good

Parts Fit/Finish Very good

Durability Good

Overall Performance Good

SPECS

SCALE 1/8

STREET PRICE \$375

DIMENSIONS

Length (chassis) 17.75 in. (450mm)

Wheelbase 11.75 in. (298mm)

Width 8.56 in. (217mm)

WEIGHT

Total, as tested 5 lb., 2 oz. (2,324g)

CHASSIS

Type Flat plate with upper strengthening beam

Material Aluminum

DRIVE TRAIN

Type Shaft-drive 4WD

Primary Clutch bell/spur gear

Drive axles Dogbones

Differential(s) Bevel gear

Bearing type Shielded

SUSPENSION (F/R)

Type Lower suspension arms with adjustable upper wishbones

Damping Oil-filled, coil-over shocks

WHEELS

Type One-piece plastic

TIRES

Type Treaded rally style with sponge insert

POWERPLANT

Engine Tamiya FS-15LT

Carb Barrel

LIKES

- Ultra-realistic looks.
- Electronics are well protected.
- Great kit to get into nitro.

DISLIKES

- Too much play in front end.
- Fuel filter isn't included.

TRACK TEST Tamiya TGX Mk.1 Rally



Below left: short of complete submersion, the TGX's sealed radio box should be able to keep your receiver and its battery pack safe from any type of dirt, debris and moisture. The servos remain exposed, however, so be careful if you want to get wet with the car. ■ Below right: the front and rear gear differentials are identical and use plastic housings with hefty, cast-alloy ring gears. The bevel pinions that drive the diffs are also cast, and the diffs are easily accessed by removing four screws.



One of the kit's key rally features is this large undercowling that is made of a flexible, highly abrasion-resistant material. Thanks to the undertray, sealed radio box, enclosed clutch bell/spur-gear mesh and aggressive tires, the rally TGX can go places the standard kit would fear to tread.

building & setup tips

As you should with any kit, read the instruction manual carefully. Tamiya's manuals help make construction a snap. Each step has full-scale schematics of the hardware used in that step; and those steps that require a part to be of a specific length, such as the steering arms, show an exact diagram of the finished assembly.

Pay close attention to the small symbols that tell you when to apply grease.

BUILDING

Step 18. Pay close attention to the installation of the center beam; it is mounted slightly to the right of the chassis' centerline. If it is installed incorrectly, it will press tightly against the engine and fuel tank.

Step 42. Attaching the undercowling. The undercowling needs a little extra trimming where it comes into contact with the front and rear gearboxes under the chassis plate. Trim off enough to make the undercowling lie flush against the gearboxes and the chassis plate.

After-run maintenance. Make sure you inspect your car after a day of running. Glow engines cause chassis vibration that loosens screws and nuts. I was reminded of this when I tested the TGX. After one of the runs, I heard a rattle when I picked up the car off the ground. It turned out that I had not fully tightened one of the engine mount's bolts. Thanks to the new undercowling, the bolt was not donated to the great outdoors; I was able to retrieve it from in between the chassis plate and the undercowling.

SETUP

I suggest that you install a complete set of ball bearings as you build the kit, especially if you plan to upgrade the TGX with the optional 2-speed transmission or race-tuned muffler and exhaust manifold.



YOU'LL NEED ■ 2-channel radio system with two servos and receiver battery ■ Fuel ■ Glow-starter ■ Paint ■ CA glue for tires ■ Thread-locking compound

FACTORY OPTIONS ■ 2-speed transmission—part no. 53201 ■ Reinforced super slicks—53264 ■ Shaped tire insert—53203 ■ Turnbuckle shaft set—53197 ■ Universal shaft set—53198 ■ Ball differential—53245 ■ Wheel axle ball-bearing set—53196 ■ TM-2 "race-tuned" muffler—41022 ■ TM-2 exhaust manifold—41023 ■ Upgraded brake disc—53171 ■ Super-low-friction damper set—53280 ■ Fuel filter—41005 ■ 1260 sealed ball-bearing set—53065 ■ 1150 sealed ball-bearing set—53029

KIT FEATURES

• **Chassis.** The TGX's foundation is a 2.5mm-thick, heavy-duty aluminum chassis plate. This heavy-duty plate and aluminum center beam make the chassis extremely rigid. Most of the plate's screw holes are countersunk (all except the engine-mounting holes).

A striking feature is the large sealed radio box/upper deck. Two servos, the receiver and the receiver battery pack all fit neatly in and on the box. After a day of running, just remove five screws, and the entire radio box, including the antenna, comes out for quick cleanup. Unlike the first TGX chassis, a plastic undercowl protects the inside from dirt and debris. Since this 4WD rally car will see on- and off-road surfaces, the cowl was a needed addition. A new molded-plastic cover encloses the pinion, spur and disc brake and keeps out harmful dirt.

• **Drive train.** Tamiya took a straightforward approach to get the power of the FS-15LT glow engine out to the four wheels. A clutch and pinion assembly bolted to the engine is mated with a centrally mounted spur gear. A propeller joint leads to the rear gearbox and accommodates both the spur gear and the thick disc brake. A rigid propeller shaft transmits the power to the front gearbox. The front and rear gearboxes are identical in construction; this minimizes the hunt for spare parts and maintenance; they also come equipped with access hatches for the differentials. Dogbones at all four corners take the energy from the gearboxes out to the wheels.



The clutch bell/spur-gear mesh is fully enclosed by a removable hatch (removed for this photo, obviously). Note the foam ring that seals the clutch bell against the housing. Clever.

• **Suspension/steering.** To handle the rigors of rally-style racing, the TGX Rally comes with lower suspension arms and adjustable upper wishbone that allow camber adjustment. Attached to these are plastic-body, oil-filled shocks. Inside each shock rides a stainless-steel shock shaft, plastic piston, rubber bladder and double O-ring seal. Snap-on-clip spacers adjust spring preload and ride height. To handle the steering, a kit servo-saver actuates the bellcrank—pretty standard stuff. Unfortunately, play in the suspension parts is also “pretty standard stuff” for the TGX. The fit of the parts could be shimmed up, but out of the box, the parts have more wiggle than I prefer.

• **Tires, wheels and body.** To negotiate on- and off-road conditions, the TGX comes with rally-style

tires; included foam inserts help make the tires more rigid. For a proper scale look, Tamiya supplies authentic-looking rims that are matched to the body included with the kit. Whichever body style you choose, expect it to look ultra-realistic. The detail and 1/8-scale size create an awesome-looking combo when tearing up your backyard.

• **Engine.** An FS-15LT pull-start engine is included and makes starting easy; no big, cumbersome starter box to lug around. The engine is tuned via a high-end needle valve and idle adjustment, but the low-end mixture is nonadjustable. A wet-type canister air filter protects the engine from being fouled with dirt, and a large fuel tank (80cc) feeds the powerplant. It comes with a built-in fuel primer that appears well sealed.

PERFORMANCE

I tested Tamiya's TGX rally machine at Trax Hobbies in Browns Mills, NJ; it has an awesome concrete tri-oval and a dirt oval. After breaking in the engine, it was time for me to get some dirt flying. With a squeeze of the throttle, all four wheels came to life, and the Impreza was off. Negotiating the turns was an absolute blast. Taking advantage of the 4WD, I nailed the throttle leaving the apex; this got the car sideways. Just like its full-scale counterparts, it can do all-wheel power slides—an intense sight.

As I leaned out the engine and started going faster, the TGX used up more and more of the big oval, so I decided it was time for a little on- and off-road running. Unlike full-fledged off-road vehicles with major ground clearance and suspensions to handle huge jumps, or on-road cars with minimal suspension, the TGX is designed to handle on- and off-road terrain. It is a tough balancing act to give a car enough stability for smooth pavement and also for rough off-road conditions, but the TGX handled this task fairly well. The car had some push on both types of surfaces, but I overcame this with throttle corrections. Low-speed steering was tight (but who goes slowly, anyway?), and it pushed a little on exiting the corners.

The TGX Rally jumped fairly well, considering its on-road heritage, but I was careful to avoid larger jumps. The full-time 4WD made stopping easy, but it did add to the push I mentioned. I learned to let off a little early, pick a line and then power through the corners to avoid the push. After a few tanks, I was able to drive some faster lines.

THE VERDICT

Tamiya has again produced a great all-around kit. The “rallyfied” TGX is perfect for those who want to move from electric to gas power. A 2-channel radio system, a glow igniter and glow fuel will get the car running. That's it. The large size mated with a glow engine and an ultra-realistic body are hard to resist. Then, when you consider the long list of the TGX Mk.I's aftermarket options, it's a no-brainer.

**Addresses are listed alphabetically in “Featured Manufacturers” on page 224. ■*

JR Racing XR-3 transmitter

JR's* budget-friendly FM radio has 3-model memory, 3 channels and an LCD screen to keep you informed about where your settings are for dual-rate steering, sub-trims,

servo position, steering endpoints, throttle endpoints and model number. I also used the radio's R133 3-channel receiver, which is a little chunky but still easily fits the TGX's cavernous radio box.



JR Racing Z2750 Super Race steering servo

I chose the ball-bearing-equipped Super Race servo to steer the TGX, and it had no trouble keeping this big car pointed in the right direction thanks to its 60 oz.-in. of torque. The TGX doesn't demand a lightning-fast servo because its soft chassis setup won't transition between turns very quickly, but the Super Race servo's speedy 0.09-second transit time certainly didn't hurt performance.

JR Racing Z250 Standard Race throttle/brake servo

I wasn't surprised that the 60 oz.-in. ball-bearing-equipped Super Race steers the TGX well, but I was surprised by the Z250 standard servo's ability to haul down this relatively heavy car. Tamiya's thick, large-diameter disc brake helps, of course, but I wasn't expecting a standard servo to work as well as it did. The TGX isn't cheap, so it's nice to know you can save a few bucks on the throttle servo.

Dynamite Blue Thunder 20-percent-nitro fuel

Blue Thunder is always in stock at the local shop, so it's usually what I run. I haven't had any trouble with it, so I keep buying it! Just be careful not to store the blue fuel next to a jug of windshield-wiper fluid, or instead of pouring life-giving nitromethane into your model, you might find yourself filling your fuel bottle with stuff designed to remove bugs and road grit.



HPI RS4 Sport 2

**HPI delivers Pro 2
tech on a “sport”
budget** by Kevin Meyer

HPI's RS4 Sport, a fiberglass chassis version of the RS4 Pro, enjoyed a long run as one of the most popular RS4 models and even saw action as the RS4 Rally—with the addition of some longer shocks and a few other rally-specific pieces. When the RS4 Pro 2 debuted, many hobbyists were quick to ask if a Sport 2 would follow. Ask no more, it's here! With all the essential design features of the Pro 2, the new Sport model could be one of the best bang-for-the-buck values around.



DATA CENTER

VEHICLE TYPE 1/10-scale, electric sport touring-car

BEST BUYER Budget-minded racer who doesn't want to sacrifice performance

KIT RATINGS (poor, satisfactory, good, very good, excellent)

Instructions Very good

Parts fit/finish Very good

Durability Very good

Overall performance Very good

SPECIFICATIONS

SCALE 1/10

LIST PRICE \$289

STREET PRICE \$160

DIMENSIONS

Wheelbase 10.1 in. (257mm)

Width (F/R) 7.45 in. (189mm)

WEIGHT

Total, as tested 51.3 oz. (1,456g)

CHASSIS

Type Double-deck

Material Fiberglass

DRIVE TRAIN

Type Dual belt

Primary Pinion/spur

Drive shafts Dogbones

Differentials Bevel gear

Slipper clutch None

Bearing type Shielded bearings

SUSPENSION (F/R)

Type Lower A-arm/upper wishbone

Damping Composite, oil-filled coil-over shocks

WHEELS

Type (F/R) Plastic 5-spoke

Dimensions (DxW) 2x1 in. (50.8x25.4mm)

TIRES

Type (F/R) 26mm belted slicks

ELECTRONICS (Not included)

Transmitter Futaba* Magnum Junior

Motor Trinity* Midnight 2

Battery Reedy* 3000

ESC LRP* Super Sport

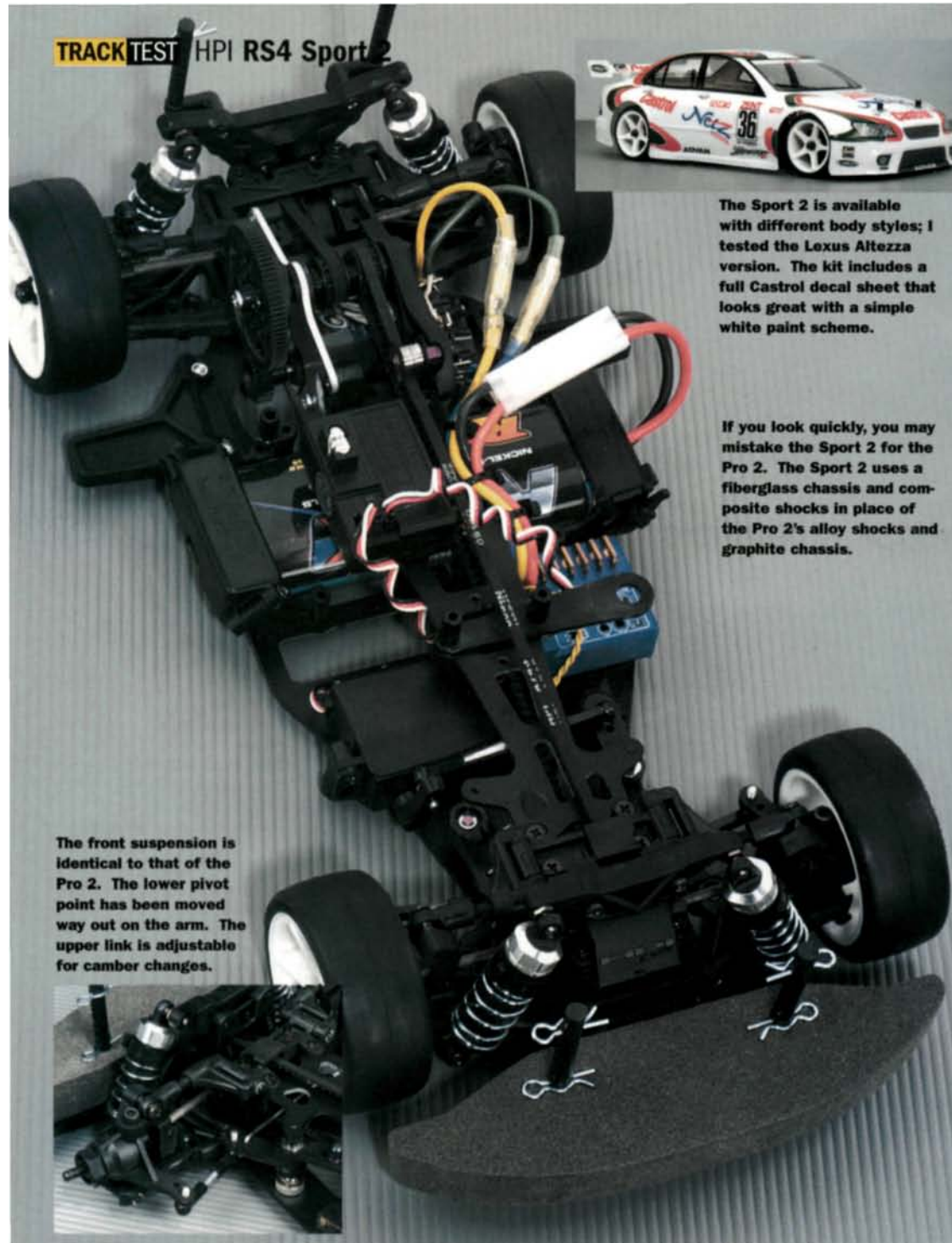
LIKES

- Pro 2 features at a "sport" price.
- Includes race-worthy tires and rims.
- Equipped with front drive-belt tensioner.
- Detailed body and decal set with window masks and overspray cover.

DISLIKES

- Turnbuckles are not included; a cheap set of steel units would have been fine, and such a race-worthy car deserves them.
- Rear belt-tension adjustments require much disassembly.

TRACK TEST HPI RS4 Sport 2



The front suspension is identical to that of the Pro 2. The lower pivot point has been moved way out on the arm. The upper link is adjustable for camber changes.



The Sport 2 is available with different body styles; I tested the Lexus Altezza version. The kit includes a full Castrol decal sheet that looks great with a simple white paint scheme.

If you look quickly, you may mistake the Sport 2 for the Pro 2. The Sport 2 uses a fiberglass chassis and composite shocks in place of the Pro 2's alloy shocks and graphite chassis.

building & setup tips

HPI has been sorting out the instructions for the RS4 series for a few years now, so I wasn't surprised when the Sport 2 went together without any real trouble. I spent a little extra time on the following:

Chassis prep. Before you start to assemble them, lightly sand the edges of the chassis pieces with 400- or 600-grit sandpaper. If you're using saddle packs, do the same with the battery openings to prevent the cells' shrink-wrap covering from being cut. After the edges are smooth, seal them with CA. Some builders skip this step, and the Sport will be just fine if built straight from the box, but I feel it's a good preventive measure against chassis wear and possible damage.

Shock assembly. In step 22, after installing the O-rings, place the shock bottom on a hard, flat surface, and press on the shock body to snap the seal cap into place. Before installing the shock shafts, put a drop of shock oil on the threaded end so that it will pass smoothly through the rubber O-rings. This will help keep the shaft's threads from damaging the O-rings.

Steering servo. Be sure to center the steering servo before attaching the servo arm or servo-saver. It's difficult to remove the servo arm after you've installed the servo in the chassis, so make sure it's straight before you bolt it down.

Wheels and tires. Wipe down the bonding areas of the rims and tires with alcohol or motor spray before you assemble them, and use a high-quality tire glue (Pro-Line, Losi, and Trinity are good choices) to do the job. Leave the "super" glue for broken tea-cup handles and the other goofy fixes they show on TV; super glue isn't so super for gluing tires.

YOU'LL NEED ■ 2-channel radio ■ Steering servo ■ Electronic speed control ■ 6-cell battery pack and charger ■ Motor ■ Polycarbonate-compatible paint ■ Tire glue

FACTORY OPTIONS ■ Teflon piston set—part no. 6818 ■ Aluminum bulkhead (F/R)—72017/72018 ■ Aluminum upper arm mount (two degrees)—72021 ■ Aluminum rear upper mount—72024 ■ Aluminum center bulkhead—72027 ■ Aluminum front hub carriers—72031 ■ Aluminum hex-hub clamp—72036 ■ Aluminum upright set—72065 ■ Center one-way (15T)—72037 ■ Pro spur-gear hub—72039 ■ Graphite shock towers (F/R)—73006/73007 ■ Graphite chassis—A248 ■ Graphite front/rear arms—A467 ■ Heat-sink motor plate—A789 ■ 2-speed transmission—A285 ■ Belt tensioner—A253 ■ Super shock set—A111

THE COMPETITION

	Wheelbase	Width	Weight as tested	Diff type	Chassis	List price	Street price*	Issue reviewed
HPI RS4 Sport 2	10.1 in. (256mm)	7.45 in. (189mm)	51 oz. (1,446g)	Gear	Fiberglass	\$289	\$160	11/00
Kyosho TF-3	10.3 in. (262mm)	7.9 in. (201mm)	52 oz. (1,474g)	Gear	Aluminum	\$199.99	\$109.99	10/96
Tamiya TAO-3	10.1 in. (256mm)	7.2 in. (183mm)	52 oz. (1,474g)	Ball	Fiberglass	\$199	\$119	1/97
Traxxas 4-TEC	10.1 in. (256mm)	7.05 in. (179mm)	51 oz. (1,446g)	Ball	Composite	\$180	\$109	5/98

*Prices vary depending on location.

KIT FEATURES

• **Chassis.** The RS4 Sport 2's chassis is identical to the Pro 2's, with the exception of its material. Instead of the pro-car's woven carbon-fiber construction, the sport machine uses fiberglass (as we hobbyists like to call it; it's actually an epoxy composite). All of the Pro 2 and Sport 2 parts are completely interchangeable. The Sport kit includes HPI's quick-release stick-pack holder, which fits the needs of plug-and-play drivers, but slots are also provided to fit the Pro 2's saddle-pack setup. As you would expect, the chassis is fully countersunk. The front and rear bulkheads are original RS4 Pro parts.

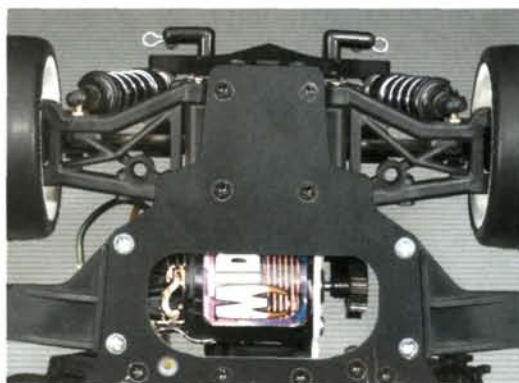
• **Drive train.** As with the original Sport, the Sport 2 makes good use of a 2-belt drive system with a high mounted layshaft. The drive pulleys are fixed for full-time 4WD, and maintenance-free gear diffs are found at the ends of the belts. The molded front belt tensioner first seen on the Pro 2 is now on the Sport model, and like the rest of the drive train, it spins on shielded ball bearings. In the rear, eccentric diff mounts allow the rear belt tension to be adjusted,



The main drive shaft secures the front and rear drive pulleys. The Sport 2 includes a ball-bearing belt tensioner to reduce belt skipping and wear. The rear arms use tweak screws to limit down-travel. Be sure to use thread-lock on the screw that holds the spur-gear mount on the drive shaft.

albeit with much disassembly. Although the Sport 2 uses dogbones to drive the wheels instead of the Pro's universals, the Sport does retain the Pro 2's axle geometry, which has the 'bones exit the diffs perpendicular to the pulleys, instead of angling back to reach the rear wheels. This results in better handling, reduced dogbone wear and greater efficiency.

• **Suspension/steering.** Plastic-body shocks replace the aluminum units found on the Pro 2, but the Sport's shocks are just as functional. Silicone fluid is supplied to fill them, and clip-on spacers are used to adjust spring preload. The suspension arms and shock towers come from the same molds as the Pro 2's parts, so geometry remains unchanged, but the Sport 2's hardware is all steel and features threaded rods in place of the Pro's aluminum ball ends and turnbuckles. Likewise, the Sport omits the Pro's stainless hinge pins in favor of less expensive pins, but this does not diminish the driving experience at



A large opening in the chassis allows the motor to sit as low as possible, keeping the center of gravity low, too. The plastic nerf bars protect the rear arms from direct impact. The most noticeable change to the rear geometry is that the dogbones now are perpendicular to the rear diff and wheels.

the wheel, though it definitely helps lower the cost of the kit.

A pair of bellcranks with an integrated, adjustable servo-saver handles the steering chores and swing the front hubs by means of threaded links. While not conveniently adjustable, the threaded rods do allow the Sport 2 to be dialed in to your liking.

• **Body, wheels and tires.** Unlike many other "sport" kits that include hard, treaded tires of dubious performance value, the Sport 2 includes a set of sticky slick tires with foam inserts that are definitely race-worthy, and you get 5-spoke, one-piece plastic wheels that are sharp-looking as well as rugged and light. The kit also includes a low-profile Altezza body and rear wing with window masks and protective overspray covering. A highly detailed set of Castrol graphics printed on full-color stretchy vinyl features all the official Team Castrol graphics plus window trim, headlights, taillights and more. Just coat the body with white, and you have everything you need to replicate the box art. If you want to switch to a different body, the Sport 2's telescoping body mounts will let you install another shell without cutting posts down or replacing them because you need longer ones.

PERFORMANCE

My first test on the Sport 2 was at the local carpet track, Race of R/C Champions, in Denver, CO. I showed up early and set up my own track layout. I kept half the oval track used by the pan cars, added two sweeper turns connected by a 60-foot straightaway and laid out tight S-curves in the infield area. The kit comes with sticky rubber tires and foam inserts, but for carpet, I bolted on a set of Pro-Line* double-purple foams up front and greens on the rear. The car had just enough slide to get some great 4-wheel drift through the corners, and I was able to easily tighten the line by backing off the throttle. Satisfied with the car's performance on Ozite, I went outside for some rubber-tire testing.

Continued on page 212

Futaba Magnum Junior transmitter

The Mag Junior remains one of the most popular AM systems, and with good reason; it has dual-rate steering (a must-have for racers) and adjustable throttle endpoints (a must have for gas guys). I wasn't concerned with any nitro needs for the Sport 2, but it's always good to have a versatile radio. As good as the AM Mag Junior is, I would buy a different unit if I were radio shopping today—I'd get the Magnum Junior FM. For just a little more than the AM system, you get all the glitch-resistance of an FM setup plus Futaba's excellent FM mini-receiver.

LRP Super Sport ESC

The Super Sport is the best of LRP's sport lineup and a good match for the Sport 2. If you're not into soldering, the Super's bullet connectors and Tamiya plugs make electronics installation a snap-together affair, and push-button setup makes it easy to get the ESC dialed into your radio setup. Sounds entry-level, but the Super Sport can handle some juice; it's rated for motors as low as 12 turns, but I suggest you hard-wire for that kind of power.

Trinity Midnight 2 Pro stock motor

I know, I know. I really should upgrade to the latest P2K, but the Midnight 2 is still a solid motor, and it's cheaper to run your stuff until it falls apart! The Midnight had all the torque required to blast around an indoor carpet course, and since I wasn't trying to cross a giant parking lot in a hurry, I never missed the top speed of a low-turn mod. Plus, I got plenty of run time.

Reedy Panasonic 3000 stick-pack

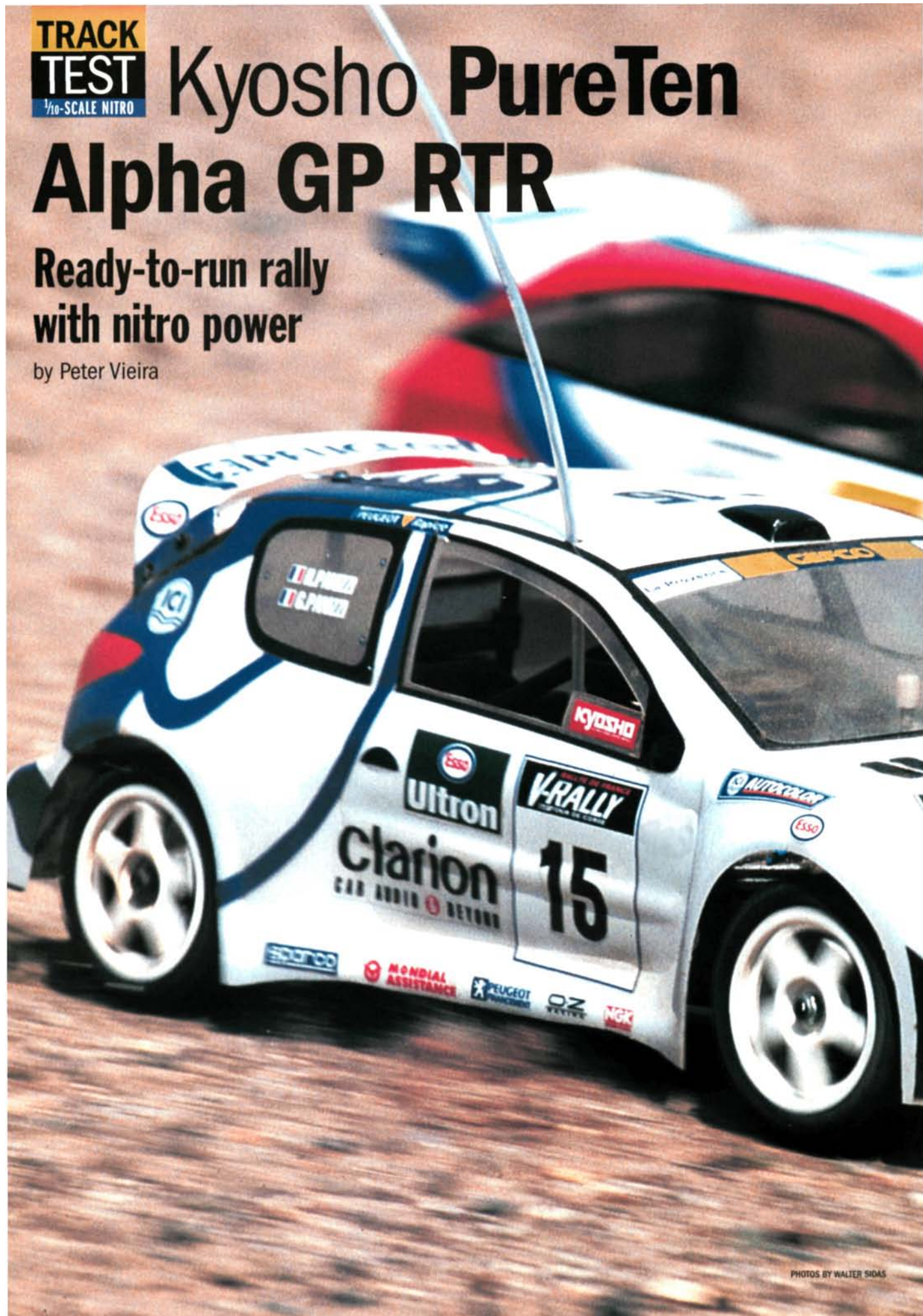
Panasonic's capacity-king cells made for long run times with my Trinity stock motor; with the kit's 28-tooth pinion. I was able to run nearly 10 minutes with liberal use of full-throttle. I monitored the pack during charging, since I don't have a charger with adjustable voltage drop (yet; one Novak Millennium, coming up). If you have to charge NiMH cells on a "regular" charger, just be sure to pull them off charge once they're warm, and they'll be fine.

**TRACK
TEST**
1/10-SCALE NITRO

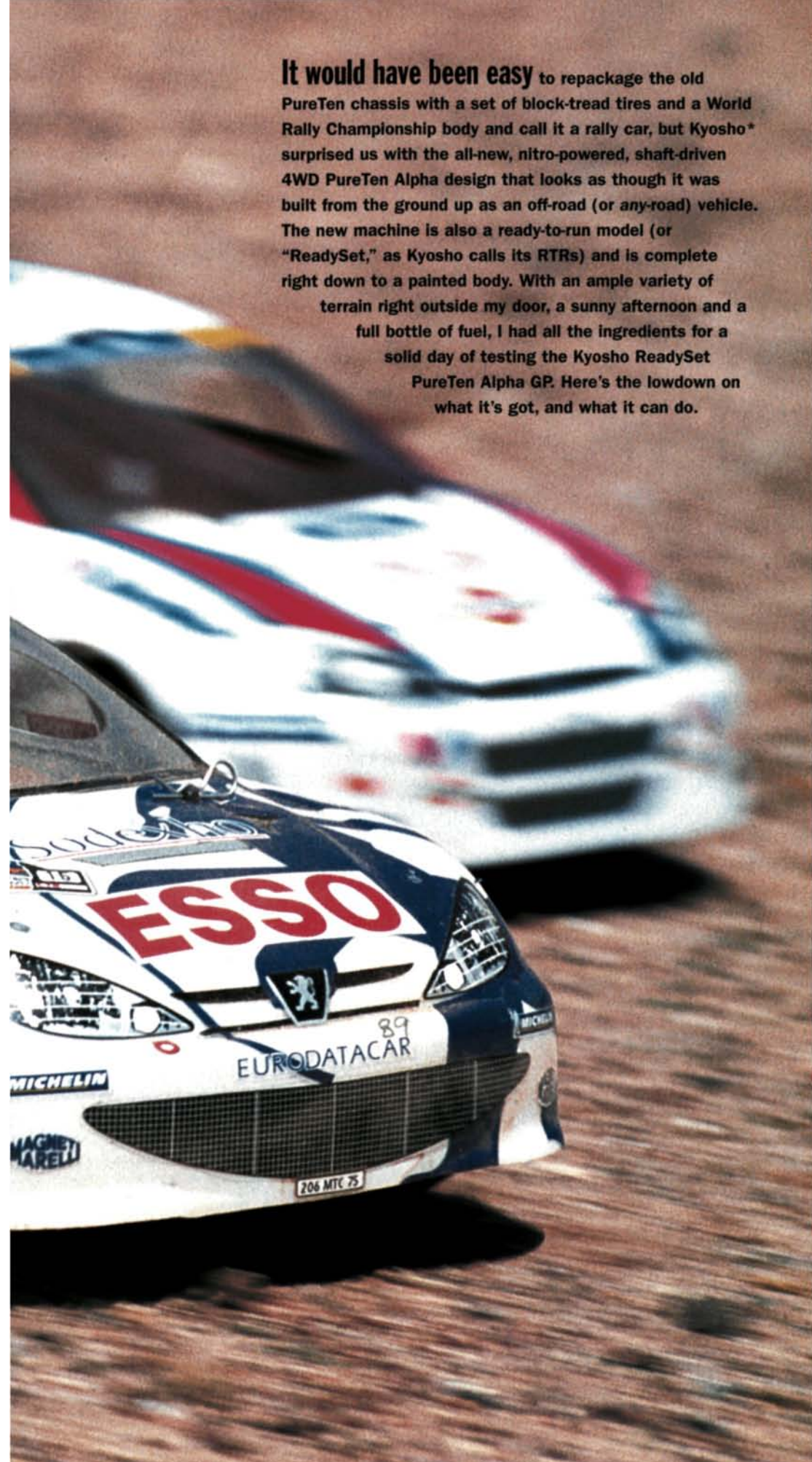
Kyosho PureTen Alpha GP RTR

**Ready-to-run rally
with nitro power**

by Peter Vieira



PHOTOS BY WALTER SIOAS



It would have been easy to repackage the old PureTen chassis with a set of block-tread tires and a World Rally Championship body and call it a rally car, but Kyosho* surprised us with the all-new, nitro-powered, shaft-driven 4WD PureTen Alpha design that looks as though it was built from the ground up as an off-road (or any-road) vehicle. The new machine is also a ready-to-run model (or "ReadySet," as Kyosho calls its RTRs) and is complete right down to a painted body. With an ample variety of terrain right outside my door, a sunny afternoon and a full bottle of fuel, I had all the ingredients for a solid day of testing the Kyosho ReadySet PureTen Alpha GP. Here's the lowdown on what it's got, and what it can do.

DATA CENTER

VEHICLE TYPE 4WD, nitro-powered, 1/10-scale rally car; ready to run with installed radio

BEST BUYER First-time RC hobbyist

KIT RATINGS (poor, satisfactory, good, very good, excellent)

Instructions Very good

Parts fit/finish Good

Durability Very good

Overall performance Good

SPECIFICATIONS

Scale 1/10

Street price \$265

DIMENSIONS

Wheelbase 10 3/16 in. (259mm)

Width 7 3/4 in. (195mm)

WEIGHT

Total, as tested 58.4 oz. (1,635.2g)

CHASSIS

Type Plate

Material Aluminum, 2.5mm

DRIVE TRAIN

Type Shaft 4WD

Primary Clutch bell/spur gear

Drive shaft Dogbone

Differential(s) Gear

Clutch 2-shoe

Bearing type Bushings

SUSPENSION

Type (F/R) Lower H-arm/fixed-length upper link

Damping Undamped spring "shocks"

WHEELS

Type One-piece molded 5-spoke plastic

Dimensions (DxW) 1.1x2 in. (51x26mm)

TIRES

Type L-pattern rally tread

POWERPLANT

Engine Kyosho GX-12

Carb Single-needle rotary

Exhaust Canister-style w/rubber extension

RADIO GEAR (included)

Transmitter Kyosho Perfex

Steering/throttle servos Kyosho Perfex KS-201

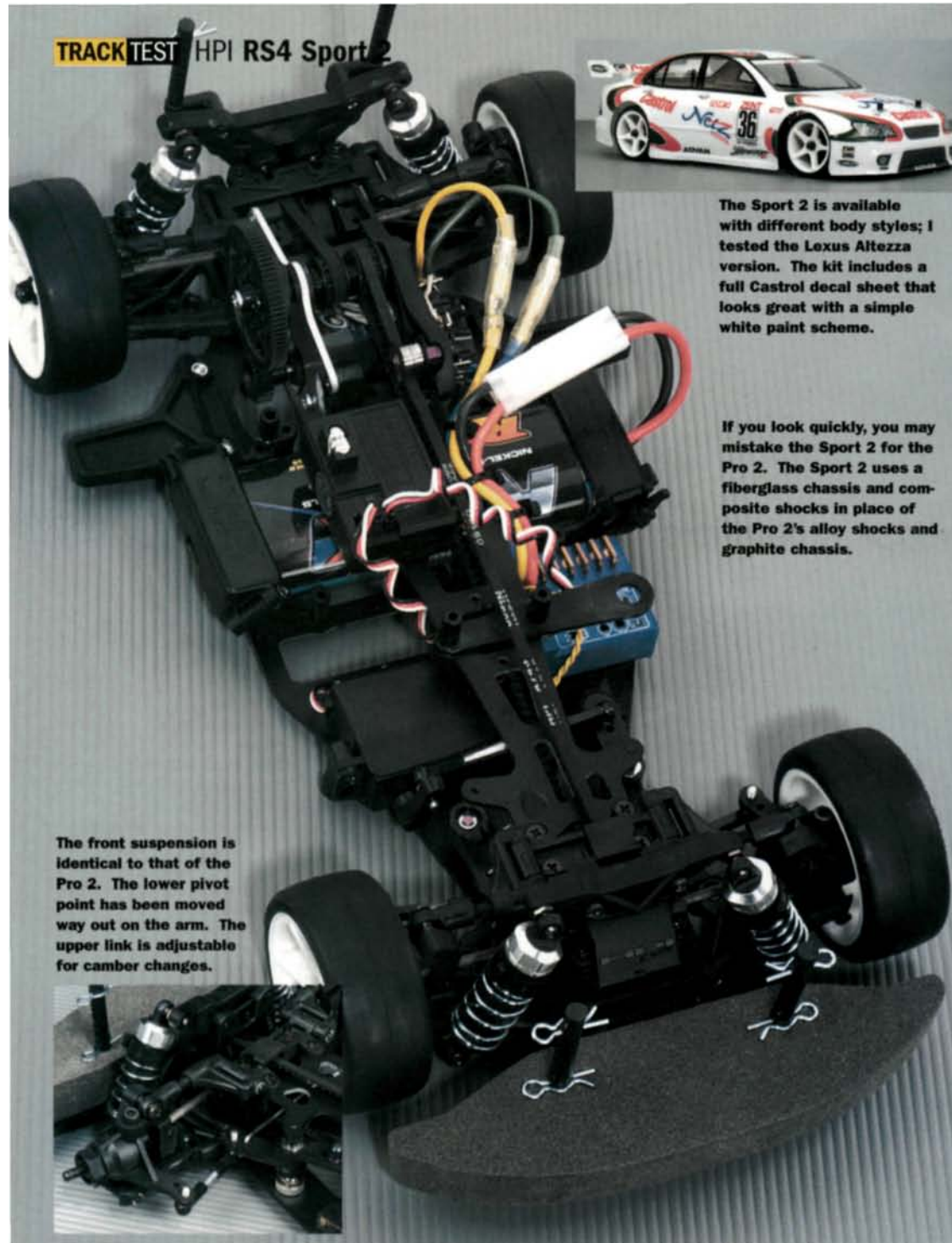
LIKES

- Simple, durable chassis design is rugged and easy to work on.
- Included body is very scale and easily finished with officially licensed decals.
- Enclosed radio box protects electronic components well.

DISLIKES

- Small heat-sink head provides insufficient cooling.
- Undamped suspension bottoms out harshly and rebounds excessively.
- No ball bearings are supplied.

TRACK TEST HPI RS4 Sport 2



The front suspension is identical to that of the Pro 2. The lower pivot point has been moved way out on the arm. The upper link is adjustable for camber changes.



The Sport 2 is available with different body styles; I tested the Lexus Altezza version. The kit includes a full Castrol decal sheet that looks great with a simple white paint scheme.

If you look quickly, you may mistake the Sport 2 for the Pro 2. The Sport 2 uses a fiberglass chassis and composite shocks in place of the Pro 2's alloy shocks and graphite chassis.

building & setup tips

HPI has been sorting out the instructions for the RS4 series for a few years now, so I wasn't surprised when the Sport 2 went together without any real trouble. I spent a little extra time on the following:

Chassis prep. Before you start to assemble them, lightly sand the edges of the chassis pieces with 400- or 600-grit sandpaper. If you're using saddle packs, do the same with the battery openings to prevent the cells' shrink-wrap covering from being cut. After the edges are smooth, seal them with CA. Some builders skip this step, and the Sport will be just fine if built straight from the box, but I feel it's a good preventive measure against chassis wear and possible damage.

Shock assembly. In step 22, after installing the O-rings, place the shock bottom on a hard, flat surface, and press on the shock body to snap the seal cap into place. Before installing the shock shafts, put a drop of shock oil on the threaded end so that it will pass smoothly through the rubber O-rings. This will help keep the shaft's threads from damaging the O-rings.

Steering servo. Be sure to center the steering servo before attaching the servo arm or servo-saver. It's difficult to remove the servo arm after you've installed the servo in the chassis, so make sure it's straight before you bolt it down.

Wheels and tires. Wipe down the bonding areas of the rims and tires with alcohol or motor spray before you assemble them, and use a high-quality tire glue (Pro-Line, Losi, and Trinity are good choices) to do the job. Leave the "super" glue for broken tea-cup handles and the other goofy fixes they show on TV; super glue isn't so super for gluing tires.

YOU'LL NEED ■ 2-channel radio ■ Steering servo ■ Electronic speed control ■ 6-cell battery pack and charger ■ Motor ■ Polycarbonate-compatible paint ■ Tire glue

FACTORY OPTIONS ■ Teflon piston set—part no. 6818 ■ Aluminum bulkhead (F/R)—72017/72018 ■ Aluminum upper arm mount (two degrees)—72021 ■ Aluminum rear upper mount—72024 ■ Aluminum center bulkhead—72027 ■ Aluminum front hub carriers—72031 ■ Aluminum hex-hub clamp—72036 ■ Aluminum upright set—72065 ■ Center one-way (15T)—72037 ■ Pro spur-gear hub—72039 ■ Graphite shock towers (F/R)—73006/73007 ■ Graphite chassis—A248 ■ Graphite front/rear arms—A467 ■ Heat-sink motor plate—A789 ■ 2-speed transmission—A285 ■ Belt tensioner—A253 ■ Super shock set—A111

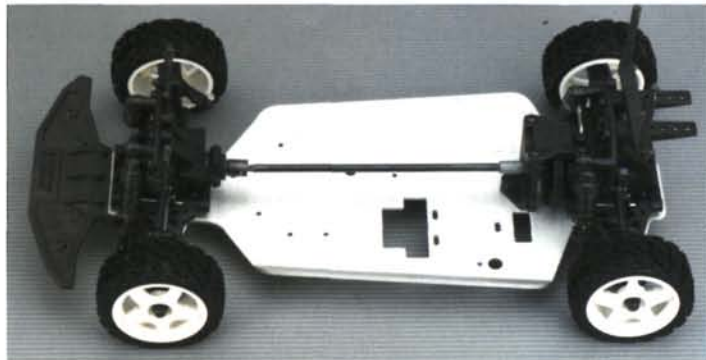
THE COMPETITION

	Wheelbase	Width	Weight as tested	Diff type	Chassis	List price	Street price*	Issue reviewed
HPI RS4 Sport 2	10.1 in. (256mm)	7.45 in. (189mm)	51 oz. (1,446g)	Gear	Fiberglass	\$289	\$160	11/00
Kyosho TF-3	10.3 in. (262mm)	7.9 in. (201mm)	52 oz. (1,474g)	Gear	Aluminum	\$199.99	\$109.99	10/96
Tamiya TAO-3	10.1 in. (256mm)	7.2 in. (183mm)	52 oz. (1,474g)	Ball	Fiberglass	\$199	\$119	1/97
Traxxas 4-TEC	10.1 in. (256mm)	7.05 in. (179mm)	51 oz. (1,446g)	Ball	Composite	\$180	\$109	5/98

*Prices vary depending on location.

KIT FEATURES

• **Chassis.** Kyosho followed the standard $\frac{1}{10}$ nitro-powered handbook here and spec'd a 2.5mm aluminum chassis for the Alpha. It's a simple plate design with stamped-in kick-up, radiused sides for extra stiffness and cutouts that allow the shaft-drive system's spur gear and the engine's flywheel and



With the engine, fuel tank and radio box removed, the simplicity of the Alpha chassis is revealed. Note the large opening for the engine's pull-starter.

pull-starter assembly to poke through the chassis. Disappointingly, the screw holes in the chassis' bottom are not countersunk and remain exposed to bashing.

The top of the chassis is dominated by the plastic upper deck and its integral, casket-like radio box. A pair of body clips holds the box closed, sealing the included Perfex receiver and 4-cell battery box away from dirt and fuel.

• **Suspension and steering.** The only surprise here is the shocks: they are undamped and nonadjustable. The coil-over springs feel suitably stiff, but without a friction- or fluid-damping system to control their oscillation, the Alpha chassis rebounds heavily when the springs unload. The rest of the suspension is typical touring-car tech: lower H-arms hold hub carriers and steering knuckles, and one-piece plastic camber links and tie rods keep the wheels in check (if you're curious, the factory settings are 4 degrees negative camber on all corners, with 2 degrees rear toe).

The steering system is a double-bellcrank setup with a built-in servo-saver, and the assembly rides directly on a pair of plated standoffs—no

bushings. A Z-bend linkage joins the steering servo to the bellcranks.

• **Drive train.** The Alpha's drive train is a model of simplicity; it relies on a single steel drive shaft to spin front and rear bevel-gear differentials. Each diff is encircled by an alloy ring gear and spun by an alloy beveled pinion gear attached directly to the drive shaft, which works its mechanical magic within a sealed gearbox. This is the same type of setup, as was first seen on the Tenth Technology Predator cars and most famously exploited by the Associated TC3, and it's particularly well suited to the Alpha's all-terrain, entry-level mission. With no belts to catch debris, stretch, or adjust, the Alpha's drive train is ready for newcomer abuse.

Primary drive comes from a plastic spur gear that is joined to the main drive shaft by a short aluminum coupler. Gearing options

are limited because the plastic spur gear is keyed to its axle, and aftermarket gears cannot replace it. It's doubtful the typical Alpha buyer will even care (I don't), and there is always the option of changing the clutch bell to alter the gear ratio.

The Alpha's rotating parts spin on metal bushings—a less welcome feature. The bushings do spin silkily when new, but unless a frequent cleaning and lubing regimen is followed, they will soon become gritty and sloppy. Many other RTRs now include bearings, and I would like to see Kyosho follow suit.



The front and rear gearboxes are identical, and there's no shortage of metal in the drive train. The bevel pinion, ring gear and diff gears are all castings that operate together smoothly. The metal bushings spin nicely when new but should be replaced with bearings once they begin to wear.

• **Engine and accessories.** As with many of its other vehicles, Kyosho includes its own house-brand engine with the Alpha. In this case, it's the GX-12—a pull-start engine with a bearing-supported crankshaft and an unusually short heat-sink head that looks as if it's meant for low-profile applications. There's room for a full-size head under the body, and the extra cooling would be welcome. The mill includes a glow plug, aluminum, single-needle rotary carburetor with a 4.3mm bore and an airplane-style muffler that routes exhaust gases

INCLUDED TEST GEAR

Kyosho Perfex transmitter and receiver

Kyosho's house-brand radio is a basic but solidly constructed pistol with easy-to-use dial trims, adjustable steering rate and a three-LED battery meter. Adjustable throttle endpoints would be welcome, but as a low-budget RTR radio, the Perfex is at least on a par with other companies' offerings and a cut above some others. It's definitely worth holding onto for installation in another vehicle if you plan to expand your RC collection.

Perfex KS-201 throttle and steering servos

Except for their bright white cases, the KS-201 servos are simple "standard" units with about 40 oz.-in. of torque and decent transmit time. They are perfectly capable of controlling the Alpha chassis in all conditions.

ADDITIONAL TEST GEAR (not included)

DuraTrax nitro starter set

This box o' stuff from DuraTrax[®] includes a quart bottle of 10-percent-nitro Red Alert fuel, a Ni-Cd glow-starter, a fuel bottle, an O.S. A3 glow plug and a box wrench. I saved the glow plug as a spare, since the Alpha includes one, but everything else in the starter kit is must-have stuff. You could buy it all separately, of course, but it's easier to walk out of the hobby shop with just two boxes under your arms.

THE COMPETITION*

	Drive train	Bearings	Diffs	Shocks	Engine**	Street price†	Reviewed
DuraTrax Street Force GP	3-belt	Yes	Ball	Aluminum	Torq .15 PS	\$300	9/00
HPI Nitro RS4 RTR	3-belt	Yes	Gear	Plastic	Nitro Star .15 PS	\$300	4/99
Kyosho Alpha GP	Shaft	No	Gear	Plastic	GX-12 PS	\$265	11/00
OFNA Z-10 RTR	3-belt	Yes	Gear	Plastic	Force .12 PS	\$290	—
Traxxas Nitro 4-TEC RTR	3-belt	Yes	Gear	Plastic	TRX-15 ES	\$319	4/99

*Cars listed alphabetically by brand. All feature nitro power, full-time 4WD and installed radio systems.

**PS = pull-start; ES = electric-start

†Approximate; price varies with dealer.

TRACK TEST Kyosho PureTen Alpha GP RTR

out through the bottom of the chassis via a short rubber stinger. The engine itself is bolted directly to the chassis through three tapped holes in its case; there are no separate engine mounts. The mounting holes are slotted, so gear mesh is adjustable. There's no downside to this unless you plan to install an engine of a different brand later; to fit an engine from another manufacturer would require you to drill new mounting holes in the chassis.

The centrifugal clutch's two-shoe internals are nothing unusual, but the plastic (!) endbell is definitely something different. A thick metal ring is molded into the clutch bell to give the shoes something solid to grab, but the gear teeth are plastic. I'll be interested to see how the gear wears; in theory, the plastic spur gear and plastic clutch bell should not wear each other out unusually quickly, since they are constructed of similar materials and the GX-12 engine is relatively mild.

Fuel is supplied by a 75cc flip-top tank with a plunger-type primer, and everything is fully plumbed from the factory; just add fuel.

• **Body, wheels, and tires.** The Alpha-based rally cars are offered in a few body styles, including a Peugeot 206, Ford Focus, Mitsubishi Lancer and the ubiquitous Subaru Impreza. The bodies are factory-painted and trimmed, but decal application and cooling-hole cutting is left to the builder. All the kits get the same 5-spoke sedan-size wheels and unglued rally-block tires, which are firm enough to run without inserts.

PERFORMANCE

I've had good luck with Kyosho .12 engines, and the Alpha's GX-12 behaved just like the others I've run; it started easily, idled reliably, broke in quickly and was generally pleasant. It's not a fire-breather, though, so if you think nitro power equals blistering top speed, you'll be disappointed in the Alpha's drag-strip performance. But as geared, the Alpha does have decent torque, and until you drive it in a wide-open parking lot where its relatively low top speed is apparent, it seems fast enough. The car's undamped suspension adds to the sense of speed because it allows the chassis to wallow and bounce as if it's going 100mph, no mat-

ter what its actual velocity is. If you run off-road, you'll find the Alpha is tough to control unless the path or track is smooth. The suspension simply can't cope with bumps, and the Alpha is easily bounced off course as it bottoms out and rebounds into the air over every bump and rut.

This kind of abuse takes a toll on chassis and suspension parts, but the Alpha hung in there no matter how hard I pushed it. I thought for sure I had broken the car on a few occasions, but at worst, all I had to do to keep the car rolling was to pop a camber link or tie rod back into place. If anything, the Alpha is *more* fun when pushed past its limits. It's kind of a letdown to run the Alpha on mild terrain, knowing that a simple set of oil shocks would really hook it up, but when you push the chassis on terrain that is way past the limits of *any* sedan-proportioned car, the Alpha becomes an indestructible good-time machine (well, mostly indestructible; the body was pretty well thrashed when I had finished with the car).

The easy-to-start engine is another big plus for the Alpha, but it needs a more effective heat-sink head. I let the GX-12 powerplant cool down after each tank of fuel. There's only so much cooling its shorty-style head can provide, and it can overheat if you push it too hard. Let it cool down, and it will give you many hours of trouble-free running.

THE VERDICT

It's important to judge this car for what it is: an inexpensive RTR meant to bring newcomers into nitro-powered RC with minimum hassle. The Alpha succeeds well in that role; it is well put together, easy to operate, good looking, durable and certainly fun. I don't think anyone would be disappointed with the Alpha as a first car, but if you're hip to the benefits of ball bearings and oil shocks, the Alpha will soon have you headed back to the hobby shop for those upgrades. Get the oil shocks first; they'll make a big difference in performance from the get-go. Save the bearings for later; when the Alpha's bushings are fresh, they spin smoothly enough. In all, I'm comfortable recommending the Alpha series of nitro rally cars to any new RC hobbyist who wants to make that first car a nitro car.

**Addresses are listed alphabetically in "Featured Manufacturers" on page 224. ■*



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Cruising, crushing
and racing with the
Traxxas T-Maxx

MEGA-MAXX



RACE-MAXX



If you want to talk RC trucks, you have to talk T-Maxx. Traxxas' innovative 4WD, nitro-powered, reversing off-road machine has been a sold-out success since it hit the shelves, and it seems as though everybody has one.

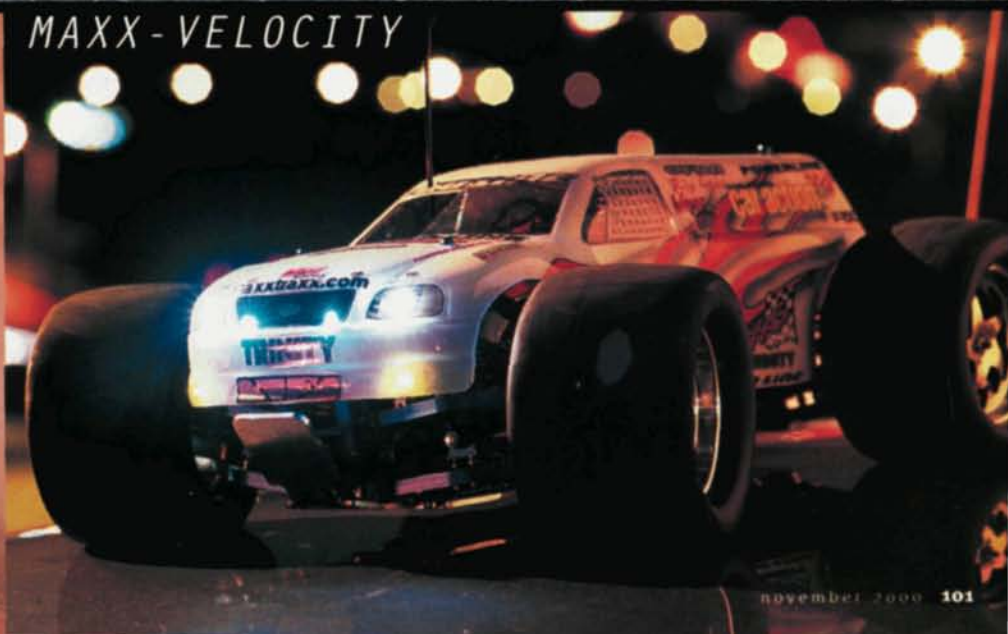
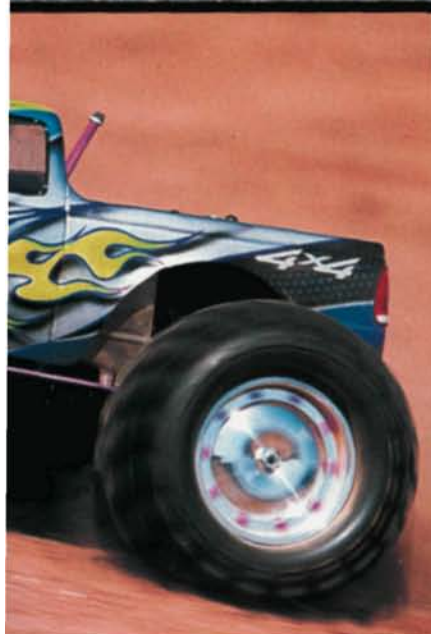
Which brings us to the one "problem" with the T-Maxx: everybody has one! Since the truck is sold completely assembled, your T-Maxx looks just like the next guy's T-Maxx, right down to the collars on the linkages. Is anyone complaining? Of course not. Are truck fans personalizing their rigs with all manner of aftermarket upgrades? No question! Just as soon as the T-Maxx became available, the aftermarket machinists and mold makers got busy tooling up for T-Maxx stuff—even before Traxxas had its own hop-up parts out the door!

We thought it would be fun to build three totally different takes on the

T-Maxx, using the latest high-zoot parts in the process. We've listed all the part numbers, and the "Mods that Made a Difference"

section clues you in to the critical modifications that most affect the way the T-Maxx performs. Some parts increase durability; some ramp up performance, and others just look cool, but they all increase the fun factor. We hope our project trucks inspire you to create your own custom creations. Send a photo!

MAXX-VELOCITY





T-MAXX PROJECT

BODY PAINTED BY MAX PERFORMANCE PRODUCTS*

MEGA-MAXX

BY KEVIN HETMANSKI

Because I am such a huge fan of monster trucks, I decided to make my truck bigger, taller and tougher than any stock T-Maxx. It was easy to jack up the body and add taller rubber to raise the truck's profile, but I wasn't about to stop there; I also added some trick aluminum parts and made some modifications to make my truck truly different—and way cooler than Bob's or Steve's.

MODS THAT MADE A DIFFERENCE

- **Traxxas solid differential spool.** The solid diff spool replaces the diff gears to provide "posi-traction" action—just the ticket for the maximum-traction crushing and cruising I had in mind.
- **Throttle-servo relocation.** I moved the throttle servo so that I'd be able to use a slide carb on the O.S. CV-X Hyper powerplant that I chose for my project. The servo occupies the space where the receiver pack once was.
- **Airtronics high-torque steering servo.** My project truck's speed potential and giant tires call for a lot of steering muscle. I installed an Airtronics 94358Z servo, which is more than up to the job with an amazing 200 oz.-in. of torque.
- **GPM ball-bearing steering bellcranks.** I replaced the stock bellcranks with aluminum units. The aluminum parts do not flex as much as the stock parts do, and that makes the truck's steering more responsive. The bellcranks pivot on ball bearings for maximum precision.
- **DuraTrax Quake tires.** The T-Maxx has impressively large tires, but I wanted to go even bigger. The extra-tall Quake tires are a direct fit on the stock T-Maxx rims, but I also swapped them for machined-aluminum hoops from Aerotech.
- **Associated Factory Team shock kit with Progressive Piggyback reservoirs.** I replaced the stock plastic shocks with Associated's new Factory Team, blue-anodized shocks and blue springs (these are the same rate as the stock Traxxas springs). The plastic units were perfectly fine, but by switching to Associated dampers, I was able to fit Progressive Piggyback reservoirs, which deliver super-plush damping action.
- **Gear-ratio change.** I was sure the T-Maxx would be way overgeared with the giant DuraTrax tires, so I switched from the Traxxas 20-tooth clutch bell to an 18-tooth unit from Associated to increase the transmission's ratio.

PERFORMANCE

Since I used taller than stock tires, I figured acceleration would suffer, even with my efforts to regear the truck for the bigger rubber. I was wrong! The truck jumped out of the hole and quickly accelerated to top speed. I was equally impressed with its braking. The high torque throttle/brake servo and GPM brake disc pull the reins on this beast without a problem. The big truck has effective on-power turning, but because of my setup's extra ground clearance, the front inside wheel lifts off the ground even more than the stock T-Maxx's.

Sure, you want your truck to handle well, but what does everyone really want to do with his T-Maxx? *Jump it!* I found a nice dirt mound and sent my truck flying. The taller tires acted like huge gyroscopes and made the truck do some pretty funky things in the air. Midair steering inputs rolled the truck onto its side, and a tap of the brakes could spin it end over end. I had to hit the jump straight to avoid crazy, out-of-control crashes.

The only glitch in my project was a problem with the rear drive shafts: they kept popping apart. I attributed this to the extra strain of the large-diameter DuraTrax tires, since I never had trouble when I used the stock rubber. I plan to add a set of MIP CVDs to solve the popping-shaft problem.

WEIGHT VS. WALLET

Total weight	10.3 lb.
Total cost, including stock T-Maxx	\$2,214



PARTS

AIRTRONICS

MS transmitter	90204FM
High-torque steering servo	94358Z

ASSOCIATED

18-T clutch bell	6568
Fuel tank	7720
Factory Team T-Maxx shock kit	1600

AEROTECH

Directional wheels	TM001
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DURATRAX

Nitro Quake tires	DTXC9725
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GPM

Machined-aluminum parts

—chassis	TMX1015
—front skidplate	TMX1331F
—rear skidplate	TMX1331R
—tranny plate	TMX1014A
—front body mount	TMX1029
—rear body mount	TMX1032
—bellcranks w/bearings	TMX1048
—steering blocks (F/R)	TMX1021
—front bulkhead brace	TMX1012A
—rear bulkhead brace	TMX1013A
—gearboxes (F/R)	TMX1011
—gearbox output bearing support	TMX1011A
—shock towers (F/R)	TMX1026

—front bulkhead side plate	TMX1012
—rear bulkhead side plate	TMX1013

GPM

Carbon brake disc	TMX1039C
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GS RACING

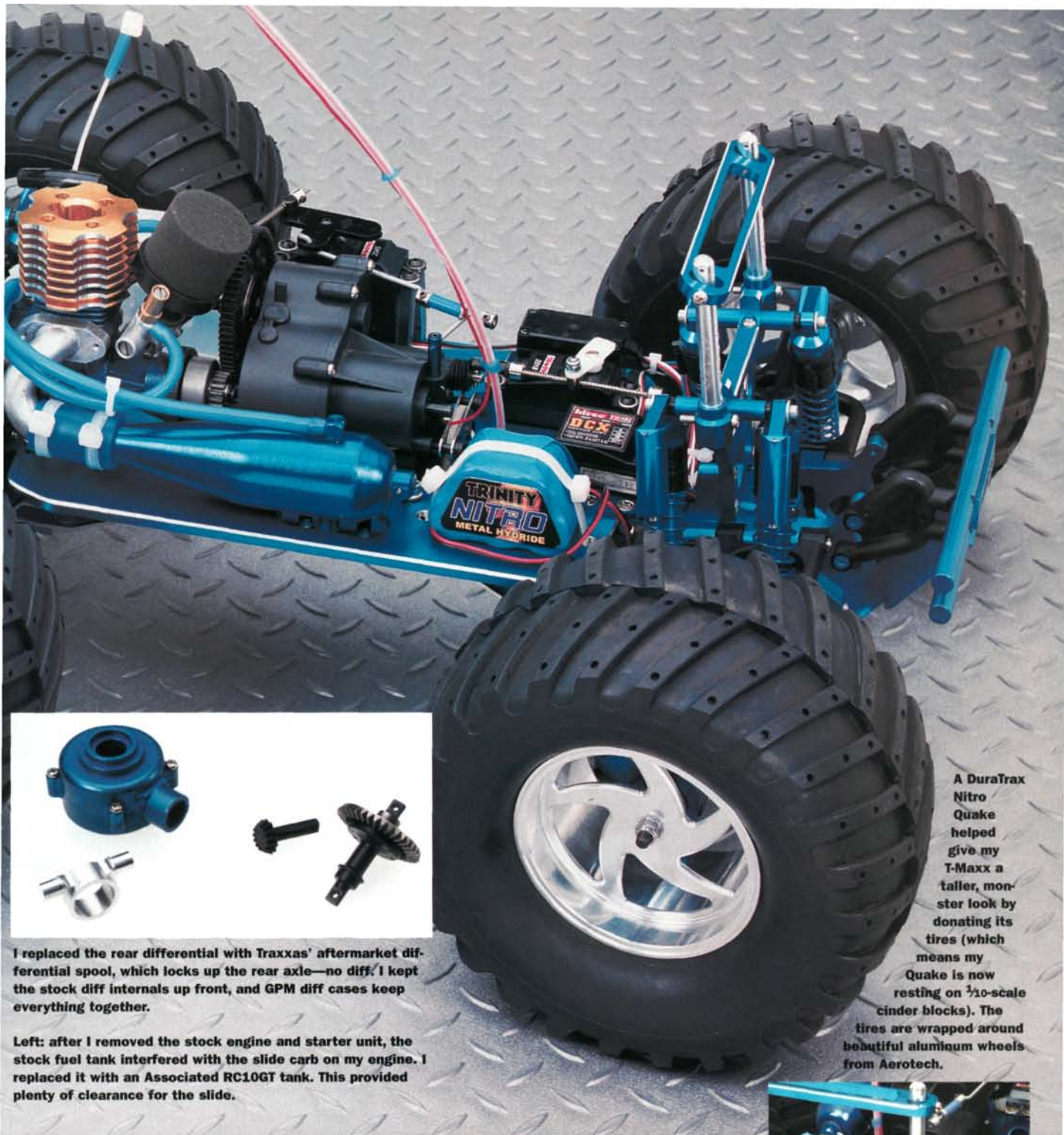
Fuel tubing	GS2452S/T3
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KIMBROUGH

Heavy-duty servo-saver	124
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MIP

4-N-1 clutch for RC10GT	3012
Heavyweight flywheel for RC10GT	3019



I replaced the rear differential with Traxxas' aftermarket differential spool, which locks up the rear axle—no diff. I kept the stock diff internals up front, and GPM diff cases keep everything together.

Left: after I removed the stock engine and starter unit, the stock fuel tank interfered with the slide carb on my engine. I replaced it with an Associated RC10GT tank. This provided plenty of clearance for the slide.

A DuraTrax Nitro Quake helped give my T-Maxx a taller, monster look by donating its tires (which means my Quake is now resting on 1/10-scale cinder blocks). The tires are wrapped around beautiful aluminum wheels from Aerotech.

O.S. ENGINES

.15 CV-X Hyper OSMG2038

PRO-LINE

F-350 T-Maxx body 3096

RC CAR KINGS

Monsta-Foam tire inserts RCK0200

TRAXXAS

Solid diff spool 4981X
Machined-aluminum engine mount .. 4960X
Stainless-steel hinge pins 4939X
Titanium turnbuckles 2338X
Anodized-aluminum pipe 4942

TRINITY

Nitro NiMH 5-cell receiver pack RC5304
Wheel nuts TK5109
Bumpers (F/R) TK5105
Monster Horsepower 20-percent-nitro fuel

I outfitted my truck with Associated's new Factory Team blue shock set, which allowed me to fit Progressive Suspension Piggyback reservoirs. This combination gives my truck ultra smooth suspension action.





T-MAXX PROJECT

RACE-MAXX

BY STEVE POND

Under "normal" circumstances, you'd never find a monster truck in my racing stable, but the introduction of the T-Maxx had me taking a second look at my vehicles. The T-Maxx is surprisingly quick and nimble, and my favorite racing haunt has even developed a respectable following of T-Maxx racers during the past season. I put on my tuner's hat while watching the Maxxes run around the track, trying to figure out how I could make this monster a little more sure-footed, and I couldn't resist the temptation to build the baddest truck in the building and teach Kevin and Bob that I will never be outdone (add sinister grin here).

MODS THAT MADE A DIFFERENCE

- **Picco .15 RC Speed pull-start engine.** The T-Maxx makes amazing use of the power from a small-block engine, but I wanted even more power. By installing the Picco powerplant, I was able to dispense with the bulky electric starter that's standard issue on the Maxx. I swiped the purple head from a prototype engine. Sorry, it isn't available on any of the production engines.
- **MIP CVD drive shafts.** The weakest link in the chain, or drive train, in this case, is the molded telescoping drive shafts. I've seen them twist right off their pivots when extra horsepower is added to the T-Maxx. The MIP drive shafts are taken right off the drawing board of those in 1/8 off-road buggies, so they're more than up to the task.
- **Traxxas 18-tooth clutch bell.** Dropping from a 20- to an 18-tooth clutch bell gives the Maxx jaw-dropping corner-to-corner acceleration. You'll have to purchase two 5x10mm bearings for installation, but you'll never get more bang for 20 bucks.
- **Pro-Line Maxx Masher tires and Trinity low-roll foam inserts.** When it comes to getting "maximum" traction, nothing matches the Mashers. They're molded from Pro-Line's M2 compound rubber for as much all-around bite as you'd ever want from a T-Maxx. The low-roll foam inserts from Trinity provide unparalleled support that further enhances traction and minimizes roll.
- **Futaba 3PJS radio and S9450 servos.** Changing to the 75-band Futaba PCM system provides me with the ultimate in competition radios, eliminates frequency conflicts and lets seven trucks run at the same time (the 27-band Traxxas radios only have six channel options). The S9450 servo is plain overkill for throttle and brake but well-suited to steering duty. The combination of the Serpent servo-saver and the powerhouse steering servo makes for very crisp steering response.
- **Hardcore Racing stuff.** Much of the Hardcore stuff is purely excessive—and I love it! If I had to narrow it down to the essentials, my choices would have to be the titanium chassis plate and skidplates. The chassis is much stiffer, and the skidplates really help firm up the area where the differentials are attached to the chassis, especially in the rear.
- **HPI Super Shocks.** I installed 11mm worth of travel limiters in the front shocks and 9mm in the rear, and I filled them with Team Losi 65WT Certified shock fluid; 65WT may seem a little excessive, but I found the stiffer suspension an asset, since it prevents much of the expected seesawing action during the transition from throttle to brake.

PERFORMANCE

This thing flies! The change in the gear ratio and the added power of the Picco engine make this truck faster out of the hole than anything short of a big-block T-Maxx. It not only rips off the line, but it does so with much less squat than the stock truck, too. The lower ride height and arms-level stance provided by the new suspension setup get the truck going with far less chassis movement. On a high-bite surface, the front wheels pull right off the ground under heavy acceleration. The initial runs were with the Racers Edge Moon Wheels, but these are purely for looks. They're fairly heavy and account for almost all of the finished truck's weight gain. Handling is also greatly improved with the combination of the suspension setup and the Pro-Line/Trinity tires and foams. The truck stays much flatter through the corners, and the bite from the tires is excellent. I estimate an increase of about 30 to 40 percent in corner speeds. I'll spare you any more gushing about how well I think this truck runs; suffice it to say that I'm very happy with the improvement in all aspects of its performance. How'd I do in our little office competition? I might be a little biased here, but this is my take on it: Kev and Bob, "Who's yer daddy?"

I installed a Picco .15 RC Speed engine and trimmed the Serpent air filter for body clearance. I stripped the stock header and Traxxas tuned pipe with over cleaner to produce the raw aluminum finish. The trick-looking braided fuel line is from Matrix. Note the MIP steel flywheel and the Robinson Racing steel spur gear.



A custom graphite battery brace holds the Mugen NiMH receiver pack. I removed the servo for the reversing mechanism and bolted the linkage rod normally used to change gears to the chassis so that the Maxx stayed in the forward gear.



PARTS

ACER RACING

- Rubber-sealed ball bearings
- for clutch bell (2) 5x10
- for steering bellcranks (4) 5x8

FUTABA

- 3PJS 3-channel PCM radio system .. 3PJS
- S9450 digital high-torque servos (2) . S9450

HARDCORE RACING

- Titanium parts
- 2mm chassis HCR-00300
- brake-caliper set HCR-00302
- rear bumper HCR-00305
- front bumper HCR-00306

- front skidplate HCR-00308
- rear skidplate HCR-00309
- pillow ball-stud sets (2) HCR-01504
- Aluminum A-arm set HCR-00304
- Carbon-fiber brake disc HCR-00301

HPI

- Super Shock set (RS4 MT rear 70-103mm) A725

KYOSHO

- Receiver cover KYOC4895P

MATRIX

- Stainless-steel braided fuel/line MS02-062

MIP

- T-Maxx CVD drive shafts (2 pair) 1485
- T-Maxx CVD center drive shafts 1486
- Clutch kit 3071
- Heavyweight steel flywheel 3073

MUGEN SEIKI

- Powerpack900 NiMH receiver pack .. B0213

PRO-LINE

- F-350 super duty body 3096
- Maxx Masher tires 1075

WEIGHT VS. WALLET

Total weight	10.5 lb.
Total cost, including stock T-Maxx	\$2,780

I made a graphite radio plate to replace the standard molded box. To make the tray, I used a piece of graphite from an old chassis and cut an HPI aluminum stand-off in half to mount it. The Kyosho receiver cover was originally semitransparent pink, but I dyed it black.



The Hardcore Racing titanium chassis and skidplates bring a whole new look to the T-Maxx. Hardcore also plans to make chassis braces, and they should be available by the time you read this. I customized a super-strong Serpent servo-saver to improve steering response. Note the Traxxas titanium steering linkage rods and the Hardcore Racing titanium bumpers.

RACERS EDGE
T-Maxx Moon Wheels RE4906

ROBINSON RACING
Steel 72-T spur gear w/bearing 8572

SERPENT
 $\frac{1}{10}$ servo-saver 1634
Air filter ELL25FATK2

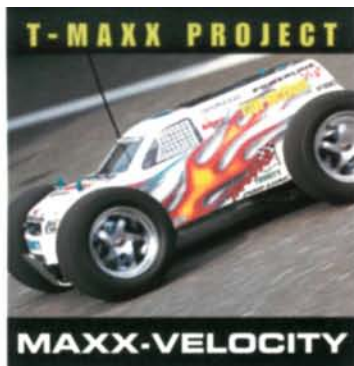
TRAXXAS
Titanium parts
—suspension hinge-pin set 4939R
—front turnbuckles (94mm) 2338X
—rear turnbuckles (105mm) 2339X

High-performance tuned pipe 4942
18-T clutch bell 4118

TRINITY
Low-roll foam inserts TK5113
Picco .15 RC speed engine TP125

The awesome-looking aluminum suspension arms from Hardcore Racing are the best I've seen (because they're on my truck, of course). I installed Hardcore Racing titanium pivot balls in the end of each arm for the ultimate in rugged suspension. HPI super shocks designed for the rear of an RS4 MT and MIP steel CVDs finish off the bulletproof suspension package.





BY BOB HASTINGS

MODS THAT MADE A DIFFERENCE

- **Killer Bee titanium chassis.** I wanted a rigid foundation for the truck, so this was a "gotta-have." It isn't blue, but with a little patience and a lot of polish, I buffed the upper surface to a mirror-like finish; this really highlights the little anodized details I added and was well worth the effort.
- **Megatech touring-car shocks.** The shocks brought the truck down nearly to the height I was after, and the threaded preload made it much easier to dial in the suspension.
- **Team Losi Certified 100WT oil.** The penalty for all that gleaming metal goodness is a total weight of 10.3 pounds, which calls for some thick goo in the shocks. The 100WT oil proved to be the best overall blend to handle damping.
- **Traxxas aluminum tuned pipe.** The stock Pro .15 is an all-around good workhorse, but the powerplant really springs to life in performance and looks with this simple add-on.
- **Traxxas 22-tooth clutch bell.** I was after more top-end speed, so I installed the largest Traxxas bell I could get my hands on.
- **Robinson 65-tooth steel spur gear.** Although intended for the Traxxas Rustler, this was just the ticket to complete the driveline. I had used up all the room in the chassis' engine-mounting slots and had to shim up the engine to accommodate the smaller spur.
- **Racers Edge wheels and shaved tires.** What would a street racer be without a set of slicks? Unfortunately, nobody makes them for the Maxx's rim size. I cut away the tread with body scissors, then I rough-sanded the tires on a belt sander. I completed the final smoothing by mounting the tires on a drill press and carefully smoothing the high spots.
- **Pro-Line F-150 street truck body.** I fell in love with this 190mm Ford shell a while ago but guarded it for a special project. After a notebook's worth of doodles, I airbrushed the cascading five-color flame job using Parma FasKolor.

PERFORMANCE

When people see my truck for the first time, they either freak because this former monster now barely clears an M&M, or they can't believe I would actually drive what looks like an anodized escapee from the Museum of Modern Art. If the radical stance and unique Pro-Line body aren't enough to make people do a double-take, the RAM foglights and RC Neon headlamps do the trick. Both companies' RC lights are visible in broad daylight from several hundred feet away. With the lights on, the T-Maxx resembles a low UFO on an intercept course.

After tooling around slowly to bring the Pro .15 up to temp, I was ready to take my first deep pull on the trigger. All of the anticipation that led up to this moment came to a peak as I nailed the throttle for all it was worth. The big slicks hooked up immediately; you wouldn't know that the truck carries an extra 2 pounds. The taller gearing does lengthen the time it takes to reach full speed, but the truck clearly had more top end now. Where the stock T-Maxx leans hard on its outside front wheel during turns and scrubs speed as the inside tire unloads, my rig's lower CG, stiff suspension and wide tire patches helped it stay hooked up and led to impressive cornering speeds. Another benefit of the stiff suspension is far less jacking; by eliminating the abrupt weight transfer under hard braking that the stock T-Maxx demonstrated, my truck had much shorter stopping distances than those of an out-of-the-box truck. My only real surprise during this project occurred when a rear toe-link came unscrewed from the rear bulkhead during a speed run. The truck spun out of control, narrowly missing a rather solid curb (note to self: more thread-lock next time).

The Street Maxx has a higher top end, courtesy of the Robinson 65-tooth steel spur and Traxxas 22-tooth clutch bell. The stock Pro .15 has a GPM head, a Powerline flywheel and a shot of Tamiya clear blue on the polished EZ-Start motor. The filters and cool-looking washers came from OFNA, and those touring car shocks are from Megatech.



Hard to believe this was a stock T-Maxx tire. I removed the tread using a pair of body scissors and a belt sander and then finished the truing with the tire and rim chucked in a drill press. The Racers Edge rims are a nice complement to the slicks.

WEIGHT VS. WALLET

Total weight	10.3 lb.
Total cost, including stock T-Maxx	\$2,197.74

PARTS

GPM

12-fin head Pro .15 TMX 1815

GS RACING

Aluminum stoppers GS-S01210BL
Blue nylon servo horns GS-H00710BL
Special graphite boost bottle GS-B00510BL

HITEC

High-torque steering servo HS-945MG

HOBBICO

VoltWatch HCAP0330

KILLER BEE

Titanium chassis TMaxx-ti

LOSI

100WT shock oil A-5232

MEGATECH

Touring-car shocks MTC13CB138P

OFNA

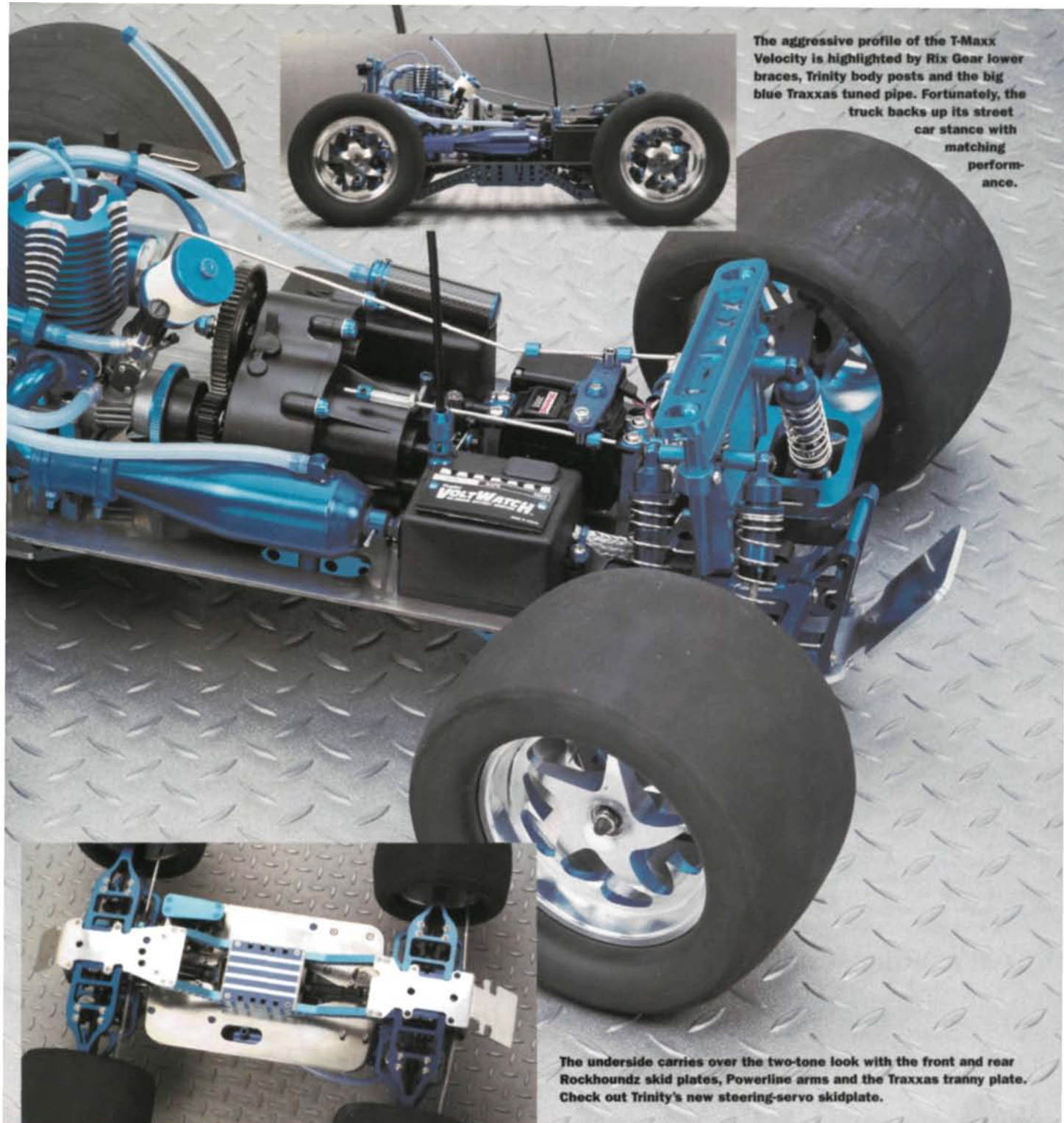
1:10 aluminum air filter 10039
Aluminum antenna holder 10140
Cap washers w/screws 10346
Fuel filter (large stone) 10166

POWERLINE

Lower arms (2) TMA 001
Shock towers (2) TMA 004
Steering knuckles (2) TMA 003
Upper arms (2) TMA 002
Engine mount TMA 009
Flywheel TMA 100
Starter drive gears TMA 110
Steering set TMA 007
Throttle servo mount TMA 008

PRO-LINE

F150 Street Truck 190mm body 3085



The aggressive profile of the T-Maxx Velocity is highlighted by Rix Gear lower braces, Trinity body posts and the big blue Traxxas tuned pipe. Fortunately, the truck backs up its street car stance with matching performance.

The underside carries over the two-tone look with the front and rear Rockhoundz skid plates, Powerline arms and the Traxxas tranny plate. Check out Trinity's new steering-servo skidplate.

RC NEON
Headlamps Kit-4

RACERS EDGE
Aluminum wheels RE 4905

RAM
Foglights and brake lamps 130

ROBINSON RACING
65-tooth metal spur gear RRP 8565

RIX GEAR
Lower braces RIXTMX100B

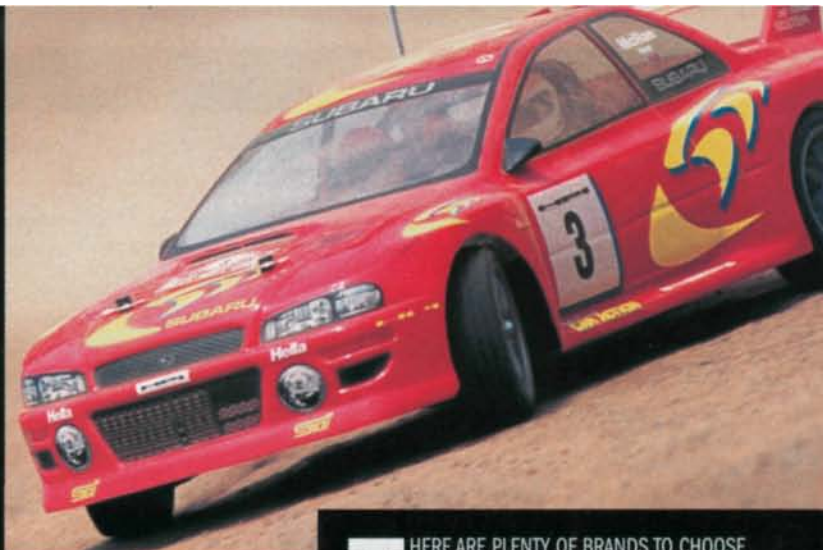
ROCKHOUNDZ
Front and rear skidplates 0051

TRAXXAS
22-tooth clutch bell 4122
Pivot balls, hard-anodized (2) 4933X
Steering-servo mount 4918X
Suspension hinge-pin set 4939X
Tuned pipe—high-performance 4942

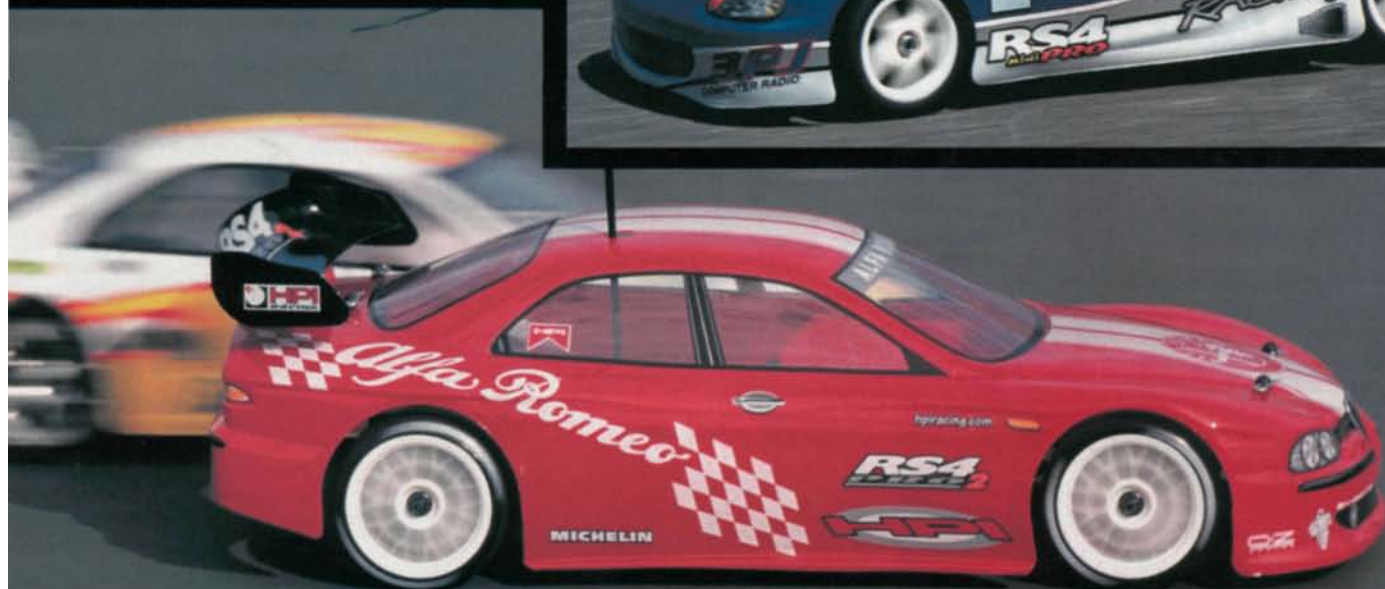
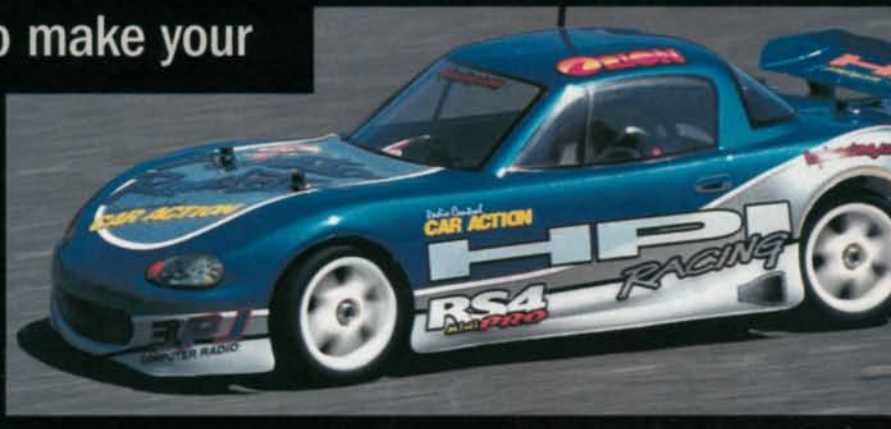
TRINITY
4-in. fluorescent tie-wraps 0677
Low-roll foam inserts TK5113
Rear body posts w/brace TK5107
Front body posts TK5108
Front body brace TK5104
Bulkhead braces (F/R) TK5101
Steering-servo skidplate TK5112
90-degree blue body clips 6094
Monster Horsepower 20-percent-nitro fuel

HPI RS4 BUYERS' GUIDE HOP-UPS

by the Staff of RC CAR ACTION



The latest parts to make your RS4-series car lighter, faster, stronger, or just plain cooler.



THERE ARE PLENTY OF BRANDS TO CHOOSE FROM in the 1/10-scale touring-car scene, but HPI* is the category's 800-pound gorilla. It seems you can't enter a race without running against a handful of HPI RS4-somethings, from Sports and Rallies to the latest Pro 2s and Nitro Racers. The incredible popularity of the RS4 series has drawn enormous aftermarket support, and the fact that many parts are interchangeable between different RS4 models increases the line's appeal to the hop-up makers.

Which brings us to this question: out of all that trick stuff, which parts will actually make a difference to your RS4's performance? With a sampling of some of the finest RS4 upgrades, we have the answers you're looking for.

HPI RS4 HOP-UPS BUYERS' GUIDE

ALUMINUM PARTS: love 'em or leave 'em?

The hottest upgrades for touring cars are aluminum anythings, and there seems to be more metal for the RS4s than for any other car. It's easy to find anodized, machined versions of the RS4's suspension arms, hubs, hub carriers and other parts. There's no denying that the parts look awesome, but they are often of dubious performance value. Some are good for go, others just for show. Here's where we weigh in on aluminum wonder widgets:

SUSPENSION ARMS. Strictly show. Aluminum arms are often heavier than their plastic counterparts and, unlike the plastic arms, they stay bent after a hit instead of rebounding back into shape. It will take a big hit to bend 'em, but big hits are common on board tracks. Aluminum arms are best left to show cars and open-parking-lot fun machines. For racing, the stock arms or HPI's graphite versions are best.



Trinity's upper-arm mounts for the Pro 2 and Nitro 2 are extra stiff for a stronger suspension system.

HUB CARRIERS. Good for show and go. These parts are so compact that bending isn't an issue, and the aluminum is far stronger than plastic so you're unlikely to tear out a ball end or a hinge pin. But strength can work against you: if the hub carriers don't give in a crash, something else will.

STEERING KNUCKLES. Good for show and go—for the same reasons as the hub carriers are. The extra stiffness of the aluminum parts is particularly welcome on sticky tracks on which steering loads are high.

SERVO MOUNTS. Strictly for show. Aluminum servo mounts won't hurt anything, but they don't increase performance either.

HARDWARE. Strictly show. Is there anyone driving an RS4 without at least one purple or blue screw? Yeah; you might save a gram or two, but these baubles are all about eye

appeal, not quicker laps. Have fun with the stuff, but don't use aluminum hardware in high-stress areas such as the bulkheads and shock towers.

Adding anodized hardware is an easy way to personalize your ride.



By virtue of its 7005 aluminum construction, GS Racing has the strongest hardware. The pile o' screws shown here is from a mix of makers, including GS, Trinity and Pentagon.

These aluminum suspension parts add a lot of glitz to this Pro 2's front end. Are they right for racing?



CHASSIS

Fiberglass-chassis cars such as the Sport, Sport 2, Rally and Mini can all benefit from a graphite chassis upgrade. Graphite is stiffer and does a better job of isolating the suspension parts so they do the shock absorbing instead of the chassis. HPI offers graphite hop-up chassis for all of its electric road cars, and there are also aftermarket options designed to offer a different handling feel from that offered by HPI's parts.

On the nitro side, the RS4 series uses a stamped, 2.5mm-thick, aluminum-plate chassis that can stand beefing up for racing use. Thicker 3mm chassis are available from a few manufacturers, and some feature extra machining for cooling fins or other details. If your tastes are more exotic, Hardcore Racing, and Killer Bee offer titanium chassis that are very stiff but also a bit heavy. If you have extra horsepower that you're having trouble getting to the ground, a little extra weight might not be a bad thing.

Wolfpack Radicals

Aluminum chassis—WLF001P, \$45.99.

Y-brace—WLF017P, \$22.99.

Radio tray—WLF002P, \$24.99.

Penguin R/C

Performance chassis—part no. P3705, \$57.99.



An aftermarket chassis kit can make your RS4 seem like a whole new car! This setup is from Wolfpack, with HG shock towers.

Penguin R/C's excellent RS4 Pro 2 chassis can also be used with the Sport 2. It includes plates to lower the chassis relative to the suspension parts for a lower CG, reconfigured chassis plates for more consistent handling and a graphite transponder mount.

PINION AND SPUR GEARS

HPI includes a perfectly good pinion and spur with all its electric kits, but you'll need more gears to dial your car in to match the track and your motor/battery setup. Some opt for 48 pitch; others go with the finer 64 pitch; or you can split the difference and go with Trinity BK gears (56 pitch). For you nitro guys, Robinson has a cool 32-pitch conversion that replaces the stock 1-module gears (25.4 pitch) and allows greater gearing flexibility.



Wolfpack Radicals

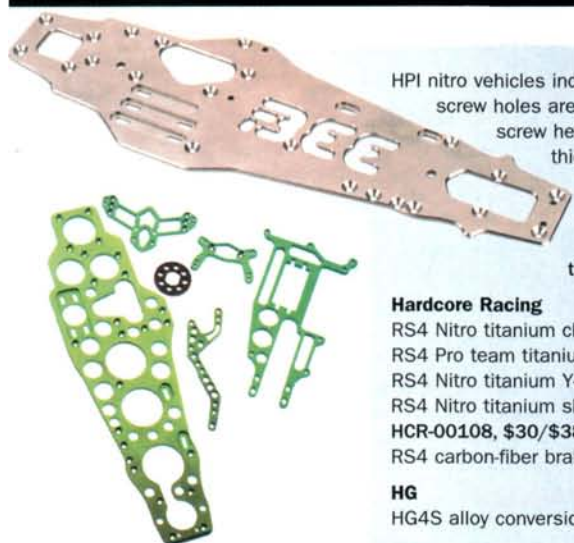
Side belt tensioner/layshaft brace—WLF015P, \$37.99.

Robinson Racing Products

Gear adapter w/44T SuperTuff gear—1535, \$18.50.



Two items of note here: the Wolfpack side-belt tensioner/layshaft support, which is a key Nitro RS4 upgrade, and the Robinson Racing 32-pitch gear conversion that allows quick spur-gear changes and increases your gearing options.



HPI nitro vehicles include aluminum chassis as stock, but the "basic" models are only 2mm thick, and the screw holes are not countersunk. Aftermarket chassis use countersunk screw holes to protect the screw heads from scraping the pavement, and—for greater strength—they're constructed of thicker (and sometimes, stronger) aluminum. Some models also feature additional machining to reduce weight or to cool the engine more efficiently.

Killer Bee Racing

Titanium chassis—HPI 3.2mm titanium chassis, \$90.

Hardcore Racing

RS4 Nitro titanium chassis—HCR-00102, \$135.
RS4 Pro team titanium upper deck—HCR-00105, \$60.
RS4 Nitro titanium Y-brace—HCR-00106, \$38.
RS4 Nitro titanium shock towers (F/R)—HCR-00107/
HCR-00108, \$30/\$38.
RS4 carbon-fiber brake disc—00109, \$20.

HG

HG4S alloy conversion kit—3000, \$349.

Titanium parts from Hardcore (in green) and Killer Bee are the latest thing in Nitro RS4 chassis. If you have more horsepower than you can handle, a heavier ti chassis could help stabilize your car. But watch out for engine heating; titanium does not cool as efficiently as aluminum.



HG offers the Torva chassis kit, which includes all of HG's aluminum suspension parts and chassis, plus aluminum body

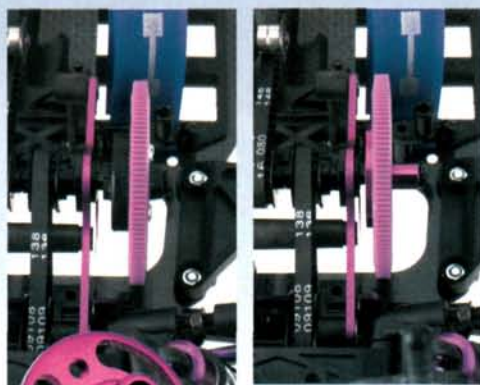
posts, titanium ball ends, lightweight aluminum diff halves and polished layshafts. HG definitely gets the "Best Presentation" award.

OFFSET SPUR-GEAR MOUNT

The stock HPI spur-gear mount hangs the gear well away from the motor plate, and that requires the pinion to be fitted close to the end of the motor's output shaft. This will exacerbate any runout in the parts, and it can contribute to gear flexing. Robinson Racing's gear mount brings the spur gear closer to the motor plate to solve those problems.

Robinson Racing Products

HPI Nitro RS4 purple gear adapter—1535, \$18.50.



Here's the spur gear on the stock gear mount (left), and here's the spur gear on the Robinson adapter (right). The gear is much closer to the motor plate.

Cross aluminum bulkheads and Robinson Racing's ultra-trick machined-aluminum disc brake outfit this RS4, along with an HPI 2-speed.

BRAKE SYSTEMS

In racing, the car that can get around the track the fastest is often also the one that can brake the hardest. The Nitro RS4 series stock plastic disc is definitely worth upgrading for race duty. One option is HPI's thick fiber disc, which is certainly durable but not perfectly flat; you'll get a little brake pulsing, and this could lead to lockup whenever you brake hard. Because of its precise machining and non-floating design, Robinson Racing's ventilated disc with machined aluminum mount runs perfectly true and provides very consistent brake action.

Cross Aluminum rear bulkhead—CH-153, \$42.

Robinson Racing Products RS4 Nitro precision aluminum brake rotor and hub with pads—1575, \$32.



BALL DIFFERENTIAL

Gear diffs have a lot going for them: they're virtually indestructible, inexpensive and don't need maintenance. If you're out for play, they're the best.

But for top racing performance in an electric RS4, a ball diff is the way to go. The diff action is smoother and adjustable, and it's much more precise, since there isn't any gear backlash or play that must be taken up before the diff gears engage.

Robinson Racing's ball diff is ultra trick and super precise.

Robinson Racing Products

HPI RS4 Nitro/Pro/Pro2 ball diff kit—(with 32T aluminum pulley and two bearings)—1590, \$52.

One-piece aluminum layshaft—1527, \$24.50.

For the ultimate in precision, Robinson's lightweight, machined RS4 layshaft is tough to beat—and it doesn't hurt that it looks awesome.



TWO-SPEED TRANNY

This is a major Nitro RS4 upgrade, but it doesn't do what most people think it does. HPI's 2-speed is designed to get your car up to speed faster by providing a low first gear. By easing the strain on the engine, it can pull a taller gear once it's up to speed, so the car has higher top speed in second gear. The 2-speed does not duplicate the "one-speed" gear ratio in first gear then add a super-tall second gear for making 60mph parking-lot passes (you can gear a 2-speed that way, but that's not how they are sold). Drop in a 2-speed, and you can expect your car to accelerate more quickly and be able to pull the one-speed cars on the straights, but don't expect its top speed to go up by 20mph.

HPI Two-speed transmission, heavy-duty (Nitro RS4)—72516, \$80.



HPI RS4 HOP-UPS BUYERS' GUIDE

Nitro hop-up tips

Chassis and drive-train hop-ups are great, but for maximum performance gain, the powerplant is the obvious place to start. This isn't really an "upgrade" issue for the electric RS4s; they don't include motors, batteries, or ESCs, so you simply bolt in as much power as you like. On the other hand, the Nitro RS4s all feature Nitro Star .12 and .15 engines that can be tweaked for more performance. If you plan to stick with Nitro Star power instead of swapping it for a full-race engine, consider adding the following parts to the stock mill:



MegaTech's Nitro RS4 pipe is sold in two models: one tuned for speed, one tuned for torque. Megatech high-speed tuned exhaust—MTCSA100, Megatech high-torque tuned exhaust—MTCSA101; \$39.95.

TUNED PIPE. This is an absolute must-have if your car includes an airplane-style muffler. You will notice much improved throttle response, more overall power and higher RPM with a tuned pipe. Top choices include pipes from HPI, Paris and O'Donnell.

HEAT-SINK HEAD. The cast head included with some Nitro RS4 kits does not provide optimum cooling, and that robs the engine of power and can shorten its life. A machined-aluminum heat-sink head offers much improved cooling with the side benefit of greatly enhanced looks.

TWO-NEEDLE CARBURETOR. The single-needle stock carbs are

This Nitro Star FE sports an HPI heat-sink head and a "spoon guard" over the nose bearing to help keep the chassis clean.



"easier to tune" simply because they have one less needle to tweak, but if you want a carb that's easy to tune for maximum performance, you need a 2-needle version (one



Always run a fuel filter on your Nitro RS4; you never know what could wind up in your fuel tank.

needle controls the mid- to full-throttle fuel/air mixture; the other controls idle to mid-range throttle). HPI offers its own 2-needle carb, or you can retrofit an O.S. 10 carburetor. For best throttle response, spring for a slide carburetor instead of a rotary one.

HEAT-SINK MOTOR PLATE

No other class of electric RC heats up its motors as much as touring cars do, so any help you can provide in the cooling department is welcome.



One good way to increase a motor's ability to shed heat while you beef up the drive train is to add a finned motor mount that has more edges from which to radiate heat.

**Trinity Motor plate—TK5000, \$24.99.
HPI Heat-sink motor plate—A248, \$30.**

Heat-sink motor plates from Trinity (in purple) and HPI help keep your motor cool; if you race, you know how hot those motors can get. Every little bit helps.



UNIVERSAL DRIVE AXLES

Unless you bought a "pro" model car, your RS4 has dogbones spinning in its outdrives. A set of universal axles will ensure smoother power delivery with greater efficiency and longer wear, and they'll even help smooth out steering action. Like many of the other hop-up items listed, HPI's factory option parts are a good choice here; but for the ultimate in performance and longevity, MIP's rebuildable CVDs are the best choice.

HPI RS4 narrow, silver (F/R)—A510/A511, \$34.

MIP MIP CVD HPI RS4 narrow (F/R)—1125/1127, \$32.



HPI universals are more than good enough for racing, but the best are MIP CVDs. The Pro 2 includes a set as standard equipment, but you can buy them separately for other RS4s.

STIFFER SHOCK TOWERS

The Pro 2 has extra-beefy plastic towers that do not need to be upgraded, but the original RS4s and Nitro RS4 2 use more flexible parts. A graphite or thick aluminum replacement will help your shocks do their job by giving them a sturdier mount, and you'll eliminate the wild card of the undamped tower flexing of your car's tuning package.

HG Shock tower set (RS4)—2105, \$34.95.

HPI Graphite front shock tower (Super)—73002, \$20.

Trinity RS4 2 rear tower—TK5002, \$25.

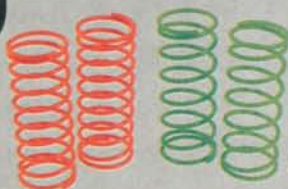


Whether you choose graphite or aluminum, an aftermarket shock tower will make sure your shocks do all the shock absorbing, and your car will look a lot more trick.

TUNING SPRINGS

If you want your RS4 to handle all types of tracks, you must have a set of tuning springs. Consider a super-stiff set (such as Trinity Congo springs) if you plan to race on carpet with foam tires.

HPI Pro linear springs, 13x29—6846 (green, 247 gf/mm), 6841 (orange, 216 gf/mm); \$5.50.



WHAT FITS WHAT?

One of the coolest things about the RS4 series is that the parts are interchangeable; for example, if you buy a trick set of machined-aluminum steering knuckles for your Pro 2, they'll also fit the rest of the RS4 cars, from electric Mini to Nitro Racer.

These are the most versatile 1/10-scale RS4 touring-car parts:

RS4 SPORT, RS4 PRO PART

RS4 SPORT, RS4 PRO PART	SHARED BY
Steering arms.....	All RS4 vehicles, including trucks
Front hub carriers.....	All RS4 series
Rear hub carriers.....	All except Pro 2, Racer 2
Front suspension arms.....	All except Pro 2, Racer 2, Minis, trucks
Rear suspension arms.....	All except Pro 2, Racer 2, Minis, trucks
Rear shock tower.....	All except Pro 2, Racer 2, trucks
Rear bulkheads.....	All except nitro trucks
Front bulkheads.....	All except nitro trucks
Motor plate.....	All electric RS4 vehicles except MT, Pro 2
Main chassis (electric).....	All except MT and Minis
Main chassis (nitro).....	All nitro vehicles except trucks and Minis



Titanium turnbuckles make your RS4 more convenient to adjust, and they're just about bend- and break-proof.

TURNBUCKLES

No self-respecting racecar keeps its suspension parts aligned with pedestrian hunks of threaded rod. Titanium turnbuckles make for quick adjustments without disassembly, and they're incredibly strong—especially in the short lengths required for the RS4 series cars.

Lunsford

RS4 Pro titanium turnbuckle sets (Pro/Nitro)—2173/2174, \$27/\$32.50.
RS4 wide titanium turnbuckle set—2175, \$27.
Pro 2 titanium turnbuckle set—2176, \$27.

Plastic shocks work fine, but a set of aluminum upgrades will definitely increase your RS4's high-tech factor. HPI's own Super Shocks are—well, super, and Pentagon makes an excellent set complete with aluminum spring perches.

ALLOY SHOCKS

From a pure performance point of view, alloy shocks are a questionable addition to the must-have list, since HPI's plastic-body shocks work just fine. Some racers even build multiple sets of plastic shocks containing fluid of different weights so that they can make damping changes by snapping a new shock into place instead of replacing the fluid. But for most of us, the psych factor of aluminum-body shocks is undeniable, and they do offer maximum precision.

HPI Super Shock set 45-56—A111, \$32.

Pentagon TC shocks—PP201B, \$21.99.



SWAYBARS

HPI's swaybar set will help your RS4 corner flatter, and the bars offer an easy way to dial traction in or out without opening the shocks or changing spring settings. A tuner's toolbox is not complete without a set (or two); get HPI's factory units.

HPI Swaybar set (narrow RS4)—A209, \$21.

BEARINGS

If you aren't hip to the benefits of ball bearings, all we can say is "Welcome to

RC" because you must be new! The latest HPI machines include shielded ball bearings, but older Sport and basic nitro kits use bushings. If you can, upgrade to sealed ball bearings for maximum life and minimum maintenance, but even the cheapest bearings will give you longer run times and higher top speeds.

DuraTrax

Bearing sets (RS4/Nitro/MT)—DTXC1340/
DTXC1342/DTXC1347, \$45/\$29/\$29.

You can get bearings in complete sets or in individual packs. Trinity, DuraTrax, Acer Racing and Boca Bearing are all good sources. All HPI "Pro" cars and many of its newest kits already include bearings, but the original Sport kits, Nitro RS4 and Nitro RS4 Mini do not.



MANUFACTURERS INDEX

Boca Bearing

www.bocabearings.com
7040 W. Palmetto Park Rd., Ste. 2304
Boca Raton, FL 33433; (561) 998-0004

Boca stocks bearings off all types including metal shielded, rubber shielded and ceramic, just to name a few.

Cross Racing

www.rc-cross.com
GTP California, 600-A Anton Blvd./404
Costa Mesa, CA 92626; (949) 756-1219

Cross makes countless upgrade parts for RS4 vehicles, all with flawless machined or molded parts.

DuraTrax

www.duratrax.com
Great Planes Model Distributors
P.O. Box 9021, Champaign, IL 61826
(217) 398-3630

DuraTrax has many aftermarket items, including electronics and complete bearing sets for many vehicles.

Eagle Racing

www.integ.com
1140 Centre Dr.
City of Industry, CA 91789; (909) 444-2766
Eagle Racing has just about everything in aluminum for the RS4, from suspension arms to steering knuckles.

GPM

www.hobbyetc.com
650 Amherst St. Greystone Plaza
Nashua, NH 03063; (603) 595-8549
GPM offers alloy suspension, chassis, and steering parts and more for many vehicles, in a variety of colors.

HG

www.1hg.com
6 Tower Heights, Albany, NY 12211
(518) 782-9255

HG's has a wide range of machined alloy parts for the RS4 and other popular cars, as well as a line of Lexan shocks and titanium hardware.

Hardcore Racing

www.racinghardcore.com
4525 East Industrial St., Unit 4R
Simi Valley, CA 93063; (805) 522-1800
Hardcore offers aluminum and titanium parts for the RS4 and other popular cars.

HPI Racing

www.hpiracing.com
15321 Barranca Pkwy., Irvine, CA 92618;
(949) 753-1099; fax (949) 753-1098.

As the maker of the RS4 series, HPI naturally offers a ton of factory hop-up parts for the cars, from chassis to wheels and tires to bodies (and everything in between).

JT Products

www.brucknerhobbies.com
2920 Bruckner Blvd., Bronx, NY 10465
(770) 963-0252

JT offers many aluminum options for upgrading your RS4. Steering and suspension components are its specialty.

Killer Bee Racing

www.killerbeerracing.com
130 Riverview Ave., Woodbridge, Ontario,
Canada L4L 2L6; (877) 313-3136
Killer Bee offers RS4 chassis in magnesium and titanium.

Lunsford Racing

www.lunsfordracing.com
2500 Three Lakes Rd., Ste. A
Albany, OR 97321; (541) 928-0587

Lunsford's titanium turnbuckles and hardware are some of the best in the biz.

Megatech

www.megatechrc.com
info@ahcmegatech.com; 8300 Tonnelie Ave.,
North Bergen, NJ 07047; (201) 662-2800.
Megatech has a large engine line and many nitro accessory items for the RS4 series.

MIP

www.miponline.com
830 W. Golden Grove Way
Covina, CA 91722; (626) 339-9007

MIP is the authority in aftermarket universal with its proven CVD design. MIP also offers engine and exhaust components, tools, and tuning accessories.

O'Donnell Racing

10702 Hathaway Dr., # 2, Santa Fe Springs, CA
90670; (562) 944-9671
O'Donnell is well known for fuel, heatsink heads, and other nitro accessories.

OFNA Racing Division

www.ofna.com
22692 Granite Way, Ste. B
Laguna Hills, CA 92653; (949) 586-2910
OFNA sells many low-cost accessory items. Check out its website to see whether it has what you're looking for.

O.S. Engines

Distributed by Great Planes, 2904 Research Rd.,
P.O. Box 9021, Champaign, IL 61826-9021;
(800) 682-8948; fax (217) 398-0008.
O.S. Engines are well known for reliability, are frequently Readers Choice favorites, and are a good choice for RS4 nitro vehicles.

Paris Racing

www.parisracing.com
4254 Independence St., Chino, CA 91710;
(909) 465-1189; fax (909) 465-0089.

Look to Paris for premium engines and pipes to fit all nitro competition applications.

Penguin R/C

www.penguinrc.com
1230-P N. Jefferson St.
Anaheim, CA 92807; (714) 630-9015
Penguin offers graphite chassis upgrades for the RS4 and other vehicles.

Pentagon

www.racing-cars.com
6302 Benjamin Rd., Ste. 404
Tampa, FL 33634; (813) 889-9691

Pentagon is distributed by Schumacher and has a large range of accessories and hardware to suit the RS4 and other makes.

Robinson Racing Products

www.robinsonracing.com
4968 Meadow View Dr.
Mariposa, CA 95338; (209) 966-2465
Robinson is known for precision-machined drive components, including pulleys, pinions, spur gears, layshafts and more.

Trinity

www.teamtrinity.com
36 Meridian Rd., Edison, NJ 08820
(732) 635-1600

Trinity is more than just fast motors and batteries; its line also includes upgrade parts such as shock towers and motor plates for the RS4 and other vehicles.

Wolfpack Radicals

www.brucknerhobbies.com
2920 Bruckner Blvd., Bronx, NY 10465
(770) 963-0252

Wolfpack parts are designed to increase the performance and durability of your car. Check out its large selection of parts for the RS4 line-up.

Team Trinity on a roll



Matt Francis



Brian Kinwald



Barry Baker

Trinity has been taking down wins like it was going out of style. At the Reedy Race of Champions at Ripon RC Speedway in California, Barry Baker took the win in the Invitational class with his Trinity-powered Yokomo sedan.

Brian Kinwald and Matt Francis continued the winning streak at the latest ROAR Off-Road Electric Modified Nationals in Dalton, GA, with Brian's dual wins in 2- and 4WD buggy, and Matt's victory in the truck class. Congratulations to the Trinity drivers for their notable achievements.

Civic-napped!

According to the makers of LoJack, their stolen vehicle-recovery system has a 90-percent success rate. Well, Team Schumacher's Jared Scott wishes he had installed it. His '99 Honda Civic Si was recently "borrowed" and never returned. If you're in Florida, look for Jared riding his Axis Pro on the highway. Sorry, ladies; seating for one only.



FISH STORY

If you've ever attended a Hobby Shack (now Hobby People) expo event, you might recognize this guy. Paul Bender and his Hobby People crew have introduced thousands to the world of RC, but now Paul would like to introduce you to a big fish: he landed this 280-pound tuna on a recent adventure. Two hundred and eighty pounds ... that's a lot of tuna salad!

Richard Saxton Steals \$10,000 from Megatech

Megatech's big-dollar contingency program helped Richard Saxton earn a fast buck. Megatech is offering thousands of dollars to the top three A-main drivers in seven selected events, provided they run Megatech engines. The ROAR Fuel Nats was one of the seven paying events, and King Richard saw an easy payday in the barely filled 1/8-scale truck class. Richard clobbered a bunch of weekend warriors with his Megatech-powered, converted TTR EB-4 to take an easy first place and a bonus of \$10,000.



Losi Spec Tire

Hot Rod Hobbies in Saugus, CA, held its third annual Off-Road Shootout, for which all the Sportsman and Novice class racers received Dirt Spec tires to run. Of 377 entries, 195 were in Sportsman and Novice classes running Dirt Spec tires. Drivers could also buy one additional set of Dirt Specs.

THE WINNERS

- Novice—Colleen Nelson
- Sport 2WD Stock—Kurt Haynes
- Sportsman Stock truck—Kurt Haynes
- Sportsman Gas truck—Greg Kishiyama

SITE SEEING

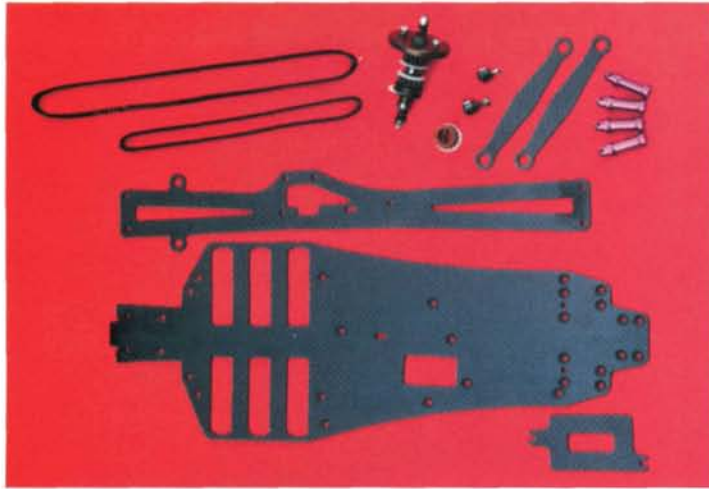


WWW.GEOCITIES.COM/RCDAVET

We stumbled across this informative website, created and maintained by Dave Treat. The site contains all kinds of useful RC data, including a frequency chart, setup sheets and some handy tips. One of the best features is the software link that hooks you up with a gearing calculator, gear finder and lap timer. Check it out.



SPEED SHOP



Schumacher CAT3000 hop-ups

Schumacher* has a full line of parts to customize your CAT, including front and rear "power rollers" to improve acceleration and belt life, 4mm front and 6mm rear Speedflex belts and a lightweight alloy rear pulley that promises quicker starts, thanks to its lower rotating mass. You can also add the Torque Distributing System (TDS) for adjustable one-way action options. Long graphite front and rear shock towers give the suspension added clearance in bumpy conditions, and alloy battery posts and carbon-fiber hold-downs replace the plastic kit parts.

Power rollers (F/R)—part nos. U2283K/U2284M, \$7.99; **Speedflex belts**—U2279F (front 4mm), U2280G (rear 6mm), \$9.99; **Torque Distributing System**—U2102V, \$79.99; **long graphite shock towers (F/R)**—U2270, \$15.99/U2271, \$18.99; **carbon-fiber chassis**—U2256D, \$59.99; **carbon-fiber top deck**—U2257E, \$29.99; **alloy battery posts**—U2218, \$15.99.



Mugen Seiki MBXRR universals

CV-style universals are one of the first upgrades on an 1/8-scale off-road vehicle. Mugen* has released its own version of the popular joint for the RR. These joints not only last longer but also reduce backlash, are rebuildable and feature two holes to insert the crosspin. If one hole shows signs of wear, simply rotate the assembly 90 degrees, and the universal will feel as good as new.

Universal set (F/R)—C0260, \$57.99; **center universal (short/long)**—C0261/C0262, \$28.99/\$29.99.

Tamiya TG10, TB-01 parts



Lately, we have featured a lot of hop-ups for the TB-01 platform; that's because, with the right options, you can take the car from fun form to race form. This month, we have a Tamiya* aluminum suspension-arm mount for the front and rear. This mount helps to eliminate suspension-arm play. The other items seen here are lightweight aluminum hubs that feature O-rings to secure the pins and prevent them from

falling out when the wheel is removed.

Aluminum suspension mount—53414, \$26; **lightweight aluminum hub**—49142, \$20.



Picco .12/.15 tuned pipe

Picco's* new dual-chamber tuned pipe is designed to improve the performance of your .12 or .15 engine. With its long convergence, the pipe should add more rpm to the top end and smooth out the low end. The pipe's mounting bracket and pressure fitting are factory installed.

Picco tuned pipe—TP7230 (Pro version), \$56.99; TP7225 (Racer version), \$39.99.



SPEED SHOP

Tamiya threaded touring shocks

Most people agree that Tamiya's "low-friction" aluminum sedan shocks are some of the smoothest around, thanks to such features as polished, anodized bores, Teflon pistons and shaft guides and bottom-loaded seals. These ultimate shocks now have threaded bodies for easy preload tweaking and include double preload collars to lock in adjustments. The new "special damper units" also feature a foam volume return spacer that is placed in the bladder.

Special damper unit—49141, \$56.



TC3 upgrades from Niftech

Niftech* offers accessories that are designed to make the TC3 lighter and faster. These include a hollow titanium drive shaft that is claimed to resist more torque than the stock shaft for quicker acceleration, hardened drive cups that are lightweight and resist wear better than the stock composite cups and new, notched diff rings and ultra-precise diff balls for a supersmooth differential. Niftech even offers special Rocket Ring diff lube in a syringe-type applicator.

Titanium drive shaft—1035T, \$49.95; hardened drive cups—1034DC, \$29.95; diff rings (notched/unnotched)—2002N/2002, \$14.95/\$10.95; 3/32 chrome-steel diff balls—2004, \$8.95; Rocket Ring diff lube—2002DLS, \$5.95.



Team Associated clutch assembly

Need a clutch assembly but can't remember all the parts numbers? Team Associated* now offers a complete clutch assembly package that includes shoes, clutch nut, flywheel spacers, collet, clutch-nut clip and low-friction bearings. Where's the clutch bell, you ask? A complete line of 32-pitch clutch bells ranging from 14- to 24T will complete the assembly.

Clutch assembly (non-pull/pull)—7621/7622, \$19.95; clutch bells (14T/15T/16T/17T/18T/22T/24T)—7609/7605/7606/7608/8902/8904, \$8.50.

Airtronics 94357Z/94358Z servos

Any racer will tell you that there is no substitute for a high-quality steering servo.

Airtronics'* new 94357Z/94358Z servos have enough power to lift a small child and do it in a blink of an eye. The 94357Z is dubbed the high-speed variant of the two with a transit time of 0.07 second for a 60-degree sweep and 125 oz.-in. of torque. The 94358Z is a little slower at 0.10 second for transit and 200 oz.-in. of torque!

ERG-VR high-speed aluminum-gear double ball-bearing servo—94357Z, \$159.99; ERG-VR high-torque aluminum-gear double ball-bearing servo—94358Z, \$159.99.



Fantom Racing Electric Motor Cleaner

The "Freak Spray" is Fantom Motors'* latest cleaning product. Its high-potency formula means this stuff will not be liked by plastics, but dirt doesn't stand a chance. If you have ever used a motor spray that doesn't clean the dust off the can, you'll appreciate the power of the Freak Spray.

Freak Spray Electric Motor Cleaner—F371, \$5.99.



sponsored by

KYOSHO
THE FINEST RADIO CONTROL MODELS

5 QUESTIONS

Age: 27

Favorite class: 1/12 mod

Home track: Norcar

Club, Cleveland, OH

When I'm not racing:

I race simulated NASCAR events competitively on my computer

Sponsors: Trinity, Associated, Novak, JR, TRC, Pro-Line, Lunsford and Protoform



Mike Blackstock

Radio Control Car Action: Is it tough being married and traveling across the country to race?

Mike Blackstock: No, because my wife, Vicki, is also a racer. We met a few years ago at a race. She's sponsored by Associated and is very competitive in the on-road circuit. Oh, and the answer to your next question is: no, she hasn't beaten me ... yet!

RCCA: We've heard that you spot for your brother, who races full-scale stock cars. What's that like?

MB: There is a lot of pressure spotting for a driver. I'm usually at the top of the stands yelling at him, screaming at him, letting him know who's around him, where there is a wreck. It's really nerve-racking, especially on the larger speedways.

RCCA: Do you think your on-road skills are an asset in other disciplines, such as off-road?

MB: I tried racing off-road years ago, but I couldn't handle the lack of traction. In general, on-road racers have a tough time driving off-road because they are always looking for the "perfect" line—straight line, corner to corner. That isn't always the best line in off-road; sometimes, it's quicker to take the long way around a turn.

RCCA: Some racers think things are getting a little out of hand with one-run tires and 7-turn motors. What's your call?

MB: Personally, I think it's stupid; I hate it! There needs to be some control in racing, either by control tires or a wind limit on motors. I don't think lengthening the race will do anything except spread the gap between factory drivers and the average racer. Something does need to be implemented. Some have suggested that maybe there should be separate pro and amateur classes. Personally, I don't like that idea. When I wasn't sponsored, I always wanted to race with the fast guys. If they make a "sportsman class," you might win it but still be 20th overall. I feel something definitely needs to be done before it starts to hurt the hobby.

RCCA: I saw you socializing with Mike Dumas, who gave you a good run at the Nationals. Do you get along with other racers, or do rivalries have a life off the track?

MB: Although I take racing very seriously and do my best for my sponsors, I try to get along with everybody. Usually, when I see Dumas, the first thing I do is give him a good twist of his left nipple. Racers usually pull some crazy stuff on each other. When it comes to actual racing, the nipple twists are left in the pits. But maybe I'll try one when I'm behind next time.

UNDER THE HOOD

MIKE'S HIGH-BITE/HIGH-TEMP ASPHALT SETUP

Right: as you can see, Mike spends a lot of time painting his bodies. Light colors are a good contrast to dark carpet and asphalt. Below: Mike's SwitchBlade is straight from the box and uses the Revolver suspension system.



Look closely, and you'll see Mike's custom rear-suspension brace. Pretty trick.



Left: Lunsford turnbuckles were used for the steering and suspension for improved durability. The servo is epoxied in; it's not going anywhere.

OPTIONS

■ Lunsford titanium turnbuckles

HIGH-BITE/HIGH TEMP ASPHALT SETUP

	FRONT	REAR
Caster/squat	3°	—
Camber	2°	—
Toe-in/out	+0.5	—
Tire height (in.)	1.75	2
Shock (one in rear)	—	—
—fluid	—	40WT
—piston	—	VCS
—spring	—	green
T-bar	—	.068

MODIFICATIONS

Mike's Trinity car is box stock, and that says a whole lot for its ability to win the Nationals; it's the same car as anyone can buy off the wall. Mike did stiffen the rear suspension mount and add Lunsford titanium for durability, but aside from that, he just drove the wheels off.

EQUIPMENT

BODY: Protoform Nissan P35

RADIO: JR R-1

RECEIVER: Novak XXL

SERVO: JR 3025

TIRES/WHEELS: TRC

TRACTION ADDITIVE: Trinity Zip-Grip

GEARING: 26/105

SPEEDO: Novak Cyclone

MOTOR: Trinity D4 10-triple

BATTERY: Trinity VIS Extra Panasonic 3000s



HOT MOD HOW TO

BUILDING A MULTI-CAR SADDLE PACK

If you race in a variety of electric classes, you probably have dedicated packs for each one: saddles with a short jumper for your touring car, a saddle with a long jumper for your four-wheel, an "LTO" pack for your oval car ... you know what we mean. It can be expensive to keep three or four packs ready to go for each car, but it's a real hassle—and tough on the cells—to change pack configurations every time you switch classes. So, while on the "thinking chair," I thought of an easy way to make a battery pack quickly reconfigurable for use in a variety of applications.

YOU'LL NEED

- Saddle-pack battery.
- Soldering iron.
- Trinity or Corally zero-loss plugs.
- ESC hookup wire (make sure the gauge you choose is compatible with the plugs; 10-gauge mega-wire is too fat).

■ STEP 1. Disassemble your packs.

Remove the fixed-length jumper wires from the battery. You may also want to remove the battery terminals or connectors at this time, as they will be replaced with Corally-style connectors.

■ STEP 2. Soldering the new

connectors. Solder the female Corally connectors to the remaining positive and negative terminals. Centering them will allow easier installation in various cars.

■ **STEP 3. Jumper wires.** Consult your car's instruction manual for the jumper-wire lengths. Make a jumper for each of your vehicles, and solder the male connectors onto the ends. Solder the male connectors to the positive and negative ESC wires so they can be plugged directly into the battery.

■ STEP 4. I hope it's clear where I'm

going with this. Now, instead of snaking 3 cells underneath belts and tweaking your car to get the pack in, you can just unplug the cells from one another and put the jumper on after the cells have been buttoned down. Need a longer jumper to put the pack in your Double-X4? Just plug one in. Need a short jumper to run all 6 cells side by side in your TC3? Plug in the length you need. Your saddle packs will also be easier to store; you can remove the jumper completely and put the packs in any tray meant for side-by-side cells.



LAST LAP

Which RC discipline produces the most talented drivers?

In my opinion, $\frac{1}{8}$ off-road produces the most talented drivers because of the all-around complexity of $\frac{1}{8}$ -scale vehicles. From their 2hp-plus engines to their multi-brakes, transmissions and diffs, it takes great skill and talent to properly operate and win with these kings of off-road racing. Also, there is the problem of knowing how to successfully jump and land them straight after hitting a jump at 50mph plus. Also, appropriate tire and insert selection can make or break a race, and if you don't have a mechanic to help you out, you'll never finish a 60-minute Main.

—Philip Alves

I race $\frac{1}{10}$ touring and off-road myself, but I personally feel that either $\frac{1}{12}$ or $\frac{1}{8}$ on-road drivers are the most skilled. Those cars are absolutely ballistic, not to mention the layout of the course. Those guys can really tear things up.

—Corey Theman

I think off-road produces the most talented drivers because it's not easy to drive on the slippery dirt surfaces. It also makes the drivers focus on their setups and tires because of the jumps and dirt.

—Jonathan Maynard

Twelfth-scale roadcourse because there is less space to pass, and the cars are extremely fast. We had several new off-road racers run $\frac{1}{12}$ -scale over the winter, and now they are unstoppable in off-road. Twelfth scale forces racers to develop skills that can be used in other types of racing. When they get outside to the bigger tracks, the skills gained during the winter make the $\frac{1}{10}$ classes much easier.

—Rick Jones

Even though it doesn't receive its share of the spotlight, I think $\frac{1}{10}$ -scale oval racing produces the most talented drivers.

—Vaughn Dent

NEXT MONTH'S QUESTION

The 27-turn stock motor has been with us since the days of 1200mAh cells. Is it time to change stock motor specs to a lower wind to better exploit the far greater capacity of today's high-performance 2000, 2400 and 3000mAh batteries?

Email your responses to gregy@airage.com.

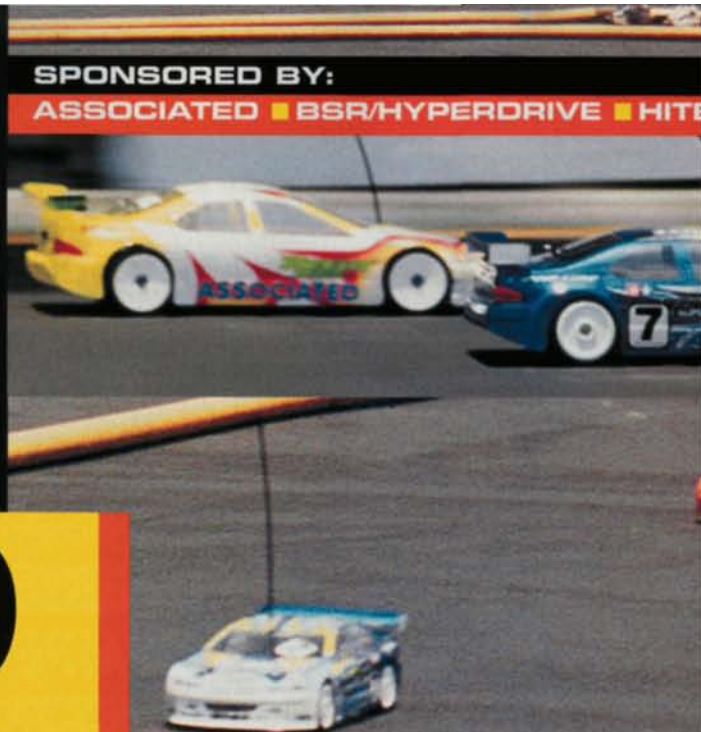
Type "Last Lap" in the subject box, or log on to "Last Lap" at www.rccaraction.com.



by Derek Buono

SPONSORED BY:

ASSOCIATED ■ BSR/HYPERDRIVE ■ HITE



ROAR

ON-ROAD NATIONALS

BAKER AND BLACKSTOCK

INVADE FLORIDA

Being crowned national champion was the hope of every racer who showed up at the 2000 $\frac{1}{12}$ and $\frac{1}{10}$ On-Road Electric Nationals at River City R/C Car Club in sunny Jacksonville, FL. More than 100 entrants competed in six classes, but the most exciting was Touring Car Modified with the factory-sponsored big guns. Tamiya, HPI, Yokomo, Associated: who would pull off the victory?

Take a journey down South to see which driver overcame the sweltering heat and high track temperatures.





PHOTOS BY DENK BUONO





ROAR ON-ROAD NATS

RACE FORMAT

■ **QUALIFYING.** This was scheduled over two days with two heats per class. Points were awarded for each qualifying position (the best possible score was zero/zero for two TQ runs). The two best qualifying positions determined the drivers' positions in the Mains.

■ **MAINS.** Like most national RC events, the On-Road Nats followed a triple-A-main format to ensure the winner of each class didn't just get lucky in one run. Drivers accumulated points as they did in Qualifying, and each driver's lowest score was dropped. If the same driver won the first two rounds of a given class, his points lead was insurmountable, and he was given the option of sitting out the third Main.

QUALIFYING

Qualifying rounds are usually fairly uneventful, but there seemed to be a buzz in the air. The bumpy track was a little tricky to lay down the power of a 7-double. Add the 180-degree Fahrenheit surface temperatures that dropped markedly as the sun set, and you had racers scrambling to get the proper tires and setup.

■ 1/10 Stock.

• **Qualifying.** In this, the smallest, class, it was hard not to make the A-main. With the handout stock motor, Dave Vera placed his Hyperdrive in the TQ spot for three of the four rounds. His car wasn't the fastest on the straights, but it consistently turned fast laps.

• **A-main 1.** With three consecutive TQ runs, it was hard to think Dave Vera would have a challenge. At the tone, he pulled the holeshot and was shadowed by Scott Jakes. Together, they pulled away from the field and opened a sizable lead. Vera didn't seem to be bothered by Jakes'



This was Barry Baker's typical position on the first day of qualifying. What a difference a night of wrenching made!

Barry Baker's Modified-winning MR-4TC Pro sedan.



pressure, and he widened his lead to beat the clock for the extra lap and the Main win (22/5:11.09). Jakes and Lopez followed him.

• **A2.** Vera again ripped a sizable holeshot, Lopez moved into second, and Jakes was right behind. The action was in the middle of the pack as Vera stretched a 10-second lead to take the overall victory in two Mains (22/5:12.21). Lopez grabbed second and Scott LaFoe third.

• **A3.** While Vera sunned it up with the national title under his belt, Jakes took the holeshot and couldn't seem to hold off Lopez, LaFoe and Bruce Carbone. LaFoe led the way for a few laps, and first was up for grabs several times. Lopez got into a rhythm and took the lead in the ninth lap for second overall (22/5:01.08).

■ 1/12 Stock.

• **Qualifying.** TJ Bradley was the man to beat. He secured TQ by winning three of the four qualifiers in a nearly perfect performance. Justin Johnson and Joe Freitas scrapped it out for sec-

ond; Freitas edged out Johnson with first and fourth qualifying finishes.

• **A-main 1.** Bradley took the lead at the start and held off the charging Tom Esposito and Freitas for a good portion of the 8 minutes, but their pressure was just too much. Esposito worked his way from the sixth to first (35/8:05.95), and Freitas took second.

• **A2.** Bradley again took the holeshot; Carbone and Freitas trailed behind. Esposito had a bad start but made quick work of the cars in front and took the lead. After minor trouble, he bounced back to fifth before making his way up to Bradley. On the last two laps, Bradley slowed, and Esposito took home the win and the overall victory by a fraction of a second (35/8:03.82).

• **A3.** Bradley again ran the fastest first lap to take another holeshot, but he faded as Freitas took advantage of Esposito's absence. Freitas worked his way up through the field and won as the clock wound down (35/8:12.47), followed closely by Billy Bruce and Bradley. Freitas claimed second overall with this victory.

■ 1/12 Modified.

• **Qualifying.** With 6 cells and modified motors, this was definitely the fastest class. Barry Baker quickly set the qualifying pace, and Team Associated's Mike Dumas turned many heads by qualifying second. Walter Henderson and Mike Blackstock settled into the third and fourth positions.

• **A-main 1.** Baker led the field, followed by Dumas and Henderson. Mike McMahon made a mid-race charge to third, while Blackstock—with 3 minutes to go—caught Baker for the lead. Dumas made a few mistakes and dropped back. Blackstock beat the horn for an extra lap and took first (39/8:11.45); Baker and McMahon rounded out the top three.



Mark Pavidis models a new line of track wear. Looking good, Mark!

HAVE TOURING CARS "KILLED" ON-ROAD?

Wedge-body pan cars once dominated on-road electric racing, and full fields or racers chased national titles. At this year's On-Road Nats, just 19 entrants showed up for 1/10 scale, and only a stock class was run. Even 1/12 scale has seen a decline over the years. Is it because of the popularity of the touring-car class? I believe it is. The realism, speed and handling of touring cars are second to none. Manufacturers are releasing more new kits and hop-ups for this class

than for any other. Who benefits? We all do—manufacturers and consumers. We get to enjoy the hard work of manufacturers who are trying to create the car to beat; prices stay competitive and performance increases. So, "Have touring cars killed on-road?" While they may have killed 1/10 on-road pan cars, touring cars have breathed new life into on-road by bringing new excitement to the class and by giving us a better selection of high-quality competitive cars.



ROAR ON-ROAD NATS



Mike Blackstock's 1/12 Modified-winning Trinity SwitchBlade.

• A2. Baker took the holeshot, followed by Dumas and Blackstock, but he had some troubles and pulled his car off early. Dumas

capitalized on this and took the lead. Blackstock and McMahon swapped positions as Dumas stretched his lead to beat the buzzer (39/8:12.57); McMahon and Blackstock rounded out the top three.

• A3. At this point, the title was still up for grabs, and thanks to their wins in the first two rounds, Blackstock and Dumas had the best chances of taking the overall victory. Baker, a solid second, was still in the running; a fast run could give him the victory. Baker took the lead at the start and held off charges from Blackstock, Dumas and Henderson. McMahon charged early to second but fell back and finished fourth. Blackstock and Dumas just couldn't catch Barry's winning time (39/8:04.41). With three different winners in each round, it came down to who had the two best finishes. Baker and Blackstock both had one victory and one second place, so all three qualifiers decided the winner. Blackstock edged Baker out with a first, a second and a third place.

■ Stock Touring Car.

• **Qualifying.** Freitas captured TQ with two first-place qualifiers. The fierce competition in qualifying separated the top positions by only fractions of a second. Freitas, Haake and Darren Shank battled relentlessly to get the best possible qualifying position.

• **A-main 1.** After the first lap, Joe Freitas was in the number-one spot. Haake peeled stickers off Freitas' bumper until he at last made a clean pass to take the lead. Tabush made his way through the pack and tucked into third as the two leaders pulled away from the field. Haake beat the buzzer for the win (21/5:15.79), and Freitas was 0.53 second behind (20/5:00.53).

• A2. At the tone, Ricky Tvoung surprised the field by taking a brief look at the lead, but by the second lap, Freitas had worked his way from third to first and pulled away. Haake settled down and caught Freitas, but Haake couldn't pass, so they crossed the line together. Freitas (21/5:12.08) edged out Haake who took second (21/5:12.37).

• A3. Haake took the lead from the start and was closely followed by Shank and Freitas. Together they freight-trained around the track for the full 5 minutes, but Haake held the others off to claim the overall win (21/5:07.77).

■ Modified Touring Car.

• **Qualifying.** This was the most exciting class to watch; some of the biggest names in the business were contenders. The real story of day one was Barry Baker. His miserable per-



Scott Haake's Stock-winning TC3 sedan.

formances in the first qualifying rounds left us wondering whether he would be able to beat the seemingly insurmountable pressure from Jared Scott, Jimmy Jacobson, Jake Pritchard and teammate Chris Tosolini. Barry stayed up all night rebuilding his car to prove that he could drive the wheels off his Yokomo. At the end of the qualifiers, defending national champion Chris Tosolini and Barry Baker gave Yokomo the 1-2 starting positions. With his Tamiya 414, Jacobson tried to lay down a trump card, but he settled nicely into third. With this much qualifying action, the Mains were bound to be spectacular!

• **A-main 1.** At the tone, Tosolini's car bobbled and lost major ground to Baker, who had a nearly perfect start. Tosolini quickly recovered and followed Baker. Jacobson and Dumas fought for third but lost ground to Paul Wynn, who cruised past and into third. Baker and Tosolini checked out and got an extra lap by beating the buzzer. Baker claimed the victory (19/4:10.18).

• A2. Tosolini set his car for the perfect launch and pulled the holeshot; Baker and Jacobson filed into second and third. Again Paul Wynn quietly made his way through the pack and into third. Baker couldn't catch Tosolini, who took the second Main (19/4:11.59).

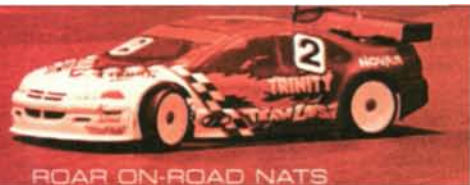


Dave Vera's 1/10 Stock-winning Hyperdrive.

new
IN THE PITS

▶ **Tamiya 414**
Jimmy Jacobson put his new Tamiya 414 securely into the A-main. This car was all business—designed to be a racecar. Only a limited number were released in the U.S., so get one, if you can.

▶ **DIAL-A-FREQUENCY RECEIVER**
Barry Baker tested Novak's new receiver and explained that it allows you to dial in your choice of frequency. This prototype was "caseless," but Barry demonstrated that with a simple twist of a screwdriver, the receiver could dial in all six 27MHz channels.



ROAR ON-ROAD NATS



Tom Esposito's 1/12 Stock-winning 12L.

• A3. The race was between the Yokomo teammates: Chris Tosolini tried to repeat his

"two-timing Tosolini" title, but Baker was just a winning machine. The sun was no longer beating directly on the track, and the cooler temperatures sped up the lap times; Tosolini held off the charging Baker for only the first seven laps. Graciously, Tosolini let the slightly quicker Baker go by, and the two tore around the track. Baker stretched his lead on Tosolini and Dumas and cinched the title (19/4:05.11). Tosolini tried to squeeze the trigger off his radio to catch up, and he almost left the door open for Dumas to steal second, but he held on to finish second with Mike Dumas' TC3 on his heels in third.

FINAL THOUGHTS

Even though the heat was overwhelming, the racing was topnotch. The host club put on a fine race. Their huge track really allowed the racers to lay down some major horsepower, while its slick surface had the mechanics scrambling for their tools. It all combined to give us exciting races, and we at *RC Car Action* congratulate everyone involved. ■

1/10 STOCK

FIN.	QUAL.	DRIVER
1	1	Dave Vera
2	5	Alex Lopez
3	3	Bruce Carbone
4	2	Scott Jakes
5	4	Scott LaFoe
6	6	John Steed
7	0	Michael Foley
8	8	Gabe Lopez
9	7	Leroy Carrigg
0	9	David Carrigg

1/12 STOCK

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR	BATTERY	ESC	RADIO	BODY	TIRES	PINION/SPUR
1	6	Tom Esposito	Trinity	Handout	Trinity	GM	JR R-1	Hot Bodies	TRC	31/100
2	2	Joe Freitas	Associated	Handout	Mad Dog	Novak	M8	Protoform	Jaco	26/100
3	1	TJ Bradley	Speedmerchant	Handout	SMC	Novak	M8	Andy's	Jaco	26/100
4	5	Billy Bruce	Associated	Handout	SMC	GM	M8	Protoform	Jaco	25/100
5	4	Bruce Carbone	Speedmerchant	Handout	New Wave	Novak	JR	Protoform	Jaco	30/100
6	7	Aaron Buran	Associated	Handout	Power Push	Novak	JR	Protoform	Jaco	-
7	0	Peter Sheldon	Speedmerchant	Handout	New Wave	LRP	M8	Protoform	Jaco	26/102
8	9	Scott Jakes	Speedmerchant	Handout	New Wave	Novak	3P	Protoform	-	-
9	8	Leon McIntosh	Associated	Handout	Reedy	LRP	M8	Protoform	-	27/100
0	3	Justin Johnson	Speedmerchant	Handout	New Wave	Novak	M8	Protoform	Jaco	26/100

1/12 MODIFIED

1	4	Mike Blackstock	Trinity	Trinity 10x3	Trinity	Novak	JR	Protoform	TRC	25/100
2	1	Barry Baker	Trinity	Trinity 12x2	Trinity	Novak	M8	Protoform	TRC	25/100
3	2	Mike Dumas	Associated	Reedy 12x2	Reedy	Novak	Hitec	Protoform	Jaco	30/100
4	9	Mike McMahon	-	-	-	-	-	-	-	-
5	5	Jake Pritchard	-	-	-	-	-	-	-	-
6	3	Walter Henderson	Associated	Reedy 13x3	Reedy	LRP	M8	Protoform	Jaco	24/100
7	6	Chris Doseck	-	-	-	-	-	-	-	-
8	7	Eric Desrosiers	Speedmerchant	Mighty 13x2	New Wave	Novak	3PJ	Protoform	Jaco	24/100
9	0	Fernando Gordinho	Trinity	Trinity 13x4	Trinity	GM	M8	Protoform	TRC	25/100
0	8	Paul Wynn	Associated	Reedy 12x3	Reedy	LRP	KO Propo	Protoform	Jaco	23/100

STOCK TOURING CAR

1	2	Scott Haake	Associated	Handout	Reedy	LRP	M8	Protoform	Yokomo	27/72
2	1	Joe Freitas	Associated	Handout	Mad Dog	Novak	M8	Protoform	Yokomo	26/72
3	5	Billy Bruce	Associated	Handout	SMC	GM	M8	Protoform	Yokomo	27/78
4	3	Darren Shank	Schumacher	Handout	Fantom	LRP	M8	Protoform	Yokomo	26/84
5	8	Frank Gomez	-	-	-	-	-	-	-	-
6	9	Aaron Buran	Associated	Handout	Power Push	Novak	JR 756	-	Yokomo	-
7	0	Cristan Tabush	Yokomo	Handout	Reedy	GM	KO EX1	Yokomo	Yokomo	24/78
8	4	Pakorn Thavoathon	Associated	Handout	Integy	Keyence	M8	Andy's	Eagle	27/72
9	7	Ricky Tvoung	Associated	Handout	Integy	Novak	3PJ	Andy's	Eagle	35/100
0	6	Leon McIntosh	Associated	Handout	Reedy	LRP	M8	Protoform	Yokomo	27/72

MODIFIED TOURING CAR

1	2	Barry Baker	Yokomo	Trinity 7x2	Trinity	Novak	M8	Andy's	Yokomo	20/78
2	1	Chris Tosolini	Yokomo	Fantom 7x2	SMC	LRP	M8	Andy's	Yokomo	20/78
3	9	Paul Wynn	Schumacher	Reedy 8x2	Reedy	LRP	KO Propo	Protoform	Yokomo	20/86
4	6	Mike Dumas	Associated	Reedy 8x3	Reedy	Novak	Hitec	Protoform	Yokomo	24/100
5	5	Jake Pritchard	Yokomo	Reedy 8x2	Reedy	GM	M8	Andy's	Yokomo	21/78
6	4	Jared Scott	Schumacher	Reedy 8x2	Reedy	LRP	M8	Protoform	Yokomo	21/87
7	8	Mark Pavidis	Associated	Reedy 8x3	Reedy	LRP	M8	Protoform	Pro-Line	23/72
8	3	Jimmy Jacobson	Tamiya	Orion 8x2	Orion	Novak	M8	Andy's	Yokomo	33/128
9	7	J.R. Mitch	Associated	Reedy 8x3	Reedy	LRP	Hitec	Protoform	Pro-Line	22/72
0	0	Mike McMahon	-	-	-	-	-	-	-	-

*- Driver did not supply information.

Paint “Tribal” Graphics

A quick, new look from a can

by Bob Hastings

Tired of the same old flames, drips and checkerboards, but can't think of something fresh for your next paint job? Go tribal! The tattoo-style paintwork seen here is a welcome break from the same-old, same-old, but the best part is that it's easy and fast to do; no airbrush required!



Step 1: Body prep.

As usual, you should clean the inside of the body thoroughly with dish soap and warm water before you begin. It's also wise to wash your hands frequently to prevent oily fingerprints from goofing up your paint job. Towel off the body (get every drop!) and apply window masks, if your body comes with them. If it doesn't, don't bother masking the windows with tape; liquid-mask the entire body.

YOU'LL NEED

- Liquid mask (Hobbico* and Bob Dively* work well).
- A cheap 1-inch brush.
- 2-inch-wide masking tape (get 3M or Duck brand).
- A hobby knife and spare blades.
- Cutting board.
- Paint and a body (duh).



Step 2: Apply liquid mask.

Shake up the liquid mask before you open the container, and peel away any “skin” or dry chunks that may be on top of the liquid before you dip in your brush. Gently tug on the bristles of the brush before use so that any loose bristles will come out in your hand and not in the masking fluid. You may even want to give the metal band that secures the bristles an extra crimp with a pair of pliers.

Now you're ready to

slather on the liquid mask. Brush in one direction, and try to lay down a smooth coat.

If there are big streaks of masking so thick that they appear opaque, those areas will dry very slowly. Conversely, if the mask is applied too thin, it will be difficult to remove and may not cover completely. Once you've entirely coated the inside of the body, set it aside to dry. This can take a while; be patient. When the liquid mask turns clear, it's dry. Apply several coats, and allow each coat to dry completely. Remember to crisscross coats to ensure that the mask fully covers the body.



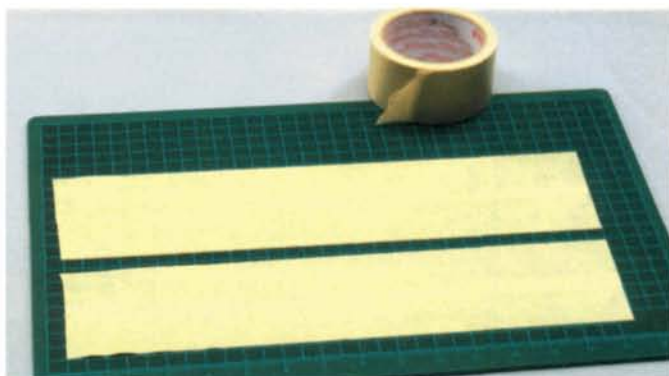
Step 3: Create the stencils.

You can use a plastic cutting board for this step, but I like to use a cutting mat; the one shown here is by Excel*.

Lay a strip of masking tape on the cutting surface, and draw your graphic directly onto it. I use a French curve to help me lay out the



shapes, but it can be done freehand as well. When you're satisfied with the look, use the hobby knife to cut out the graphic. I use the French curve to guide the knife here. If you look closely, you'll see that I taped off the blade so that it doesn't grab the plastic curve as I cut. Just the tip of the blade needs to contact the cutting surface. I have a tribal look going, but you can cut whatever you like.



Creating "mirror image" stencils

Here's an easy way to be sure your graphics are identical on both sides of the body. After you've peeled out the graphic, leave the tape "negative" on the cutting board. Place a piece of paper over this negative and color it with a pencil; the graphic will appear in the pencil tone. Now lay the graphic, pencil side down, over a new sheet of tape and trace its outline; the pencil will be transferred to the tape to form a perfect mirror image of your first graphic. The new outline will be faint and easily smudged, so beef it up with a pen before you cut it out.



Step 4: Apply the stencils.

Peel out the design, taking care not to tear it at the corners. Apply the graphic to the outside of the body. Don't worry about wrinkles and gaps. The graphic is simply a guide; it won't have to hold back paint.



Step 5: Trim the liquid masking.

From the inside of the body, trace the graphic with a hobby knife using gentle pressure, then peel out the masking. If you want to create a "shadow," reposition the graphic slightly below the first cut and retrace.

Step 6: Painting the graphics.

Now I'm ready for color; I chose red with a black "shadow." Beginning with the darker color, I peeled out the shadow area and the window moldings since I wanted them black, too. I shot two light coats and let the black dry. I followed up by removing the mask from the main graphic and spraying in the red.



Step 7: The final coat

Now it's time to pull everything together. Peel off all the masking film (except from the windows), and spray on the main body color. I used white, which is a perfect backup for red. Other color schemes may require that you back the graphics with another color before you apply the main body color. To avoid having thin spots, apply two coats of the main body color. After the paint has dried, you're ready to peel out the windows, trim the body, and add some decals.



Here it is—the finished product. The grill and headlight decals came with the body, and I added some logos from my miscellaneuous parts box.



"Addresses are listed alphabetically in "Featured Manufacturers" on page 224. ■

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If it's **RC**, you'll
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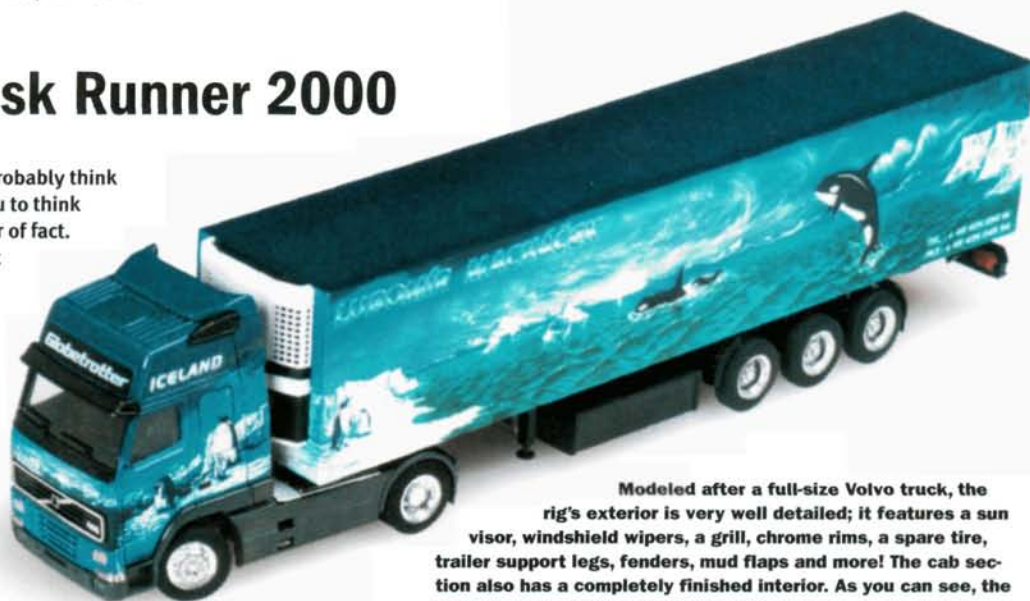
from the publishers of
RADIO CONTROL
car action

Keyence Desk Runner 2000

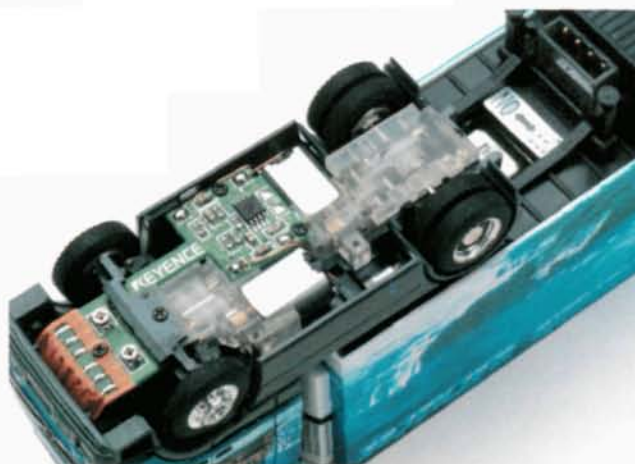
If you're into RC trucks, you probably think "big." This month, I want you to think small—HO scale, as a matter of fact.

The microelectronics wizards at Keyence® have created an RC semi that would be impressive in 1/10 scale but is downright amazing at a diminutive 8 inches long. In addition to full proportional control, the Desk Runner 2000 has tons of scale features. Let's take a closer—much closer—look at this incredible, functional model.

The Desk Runner's complete lighting system features white LED headlights that can be switched remotely from high beam to low beam. When the headlights are off, you can flash the highs to let drivers (very tiny ones) know you are coming through. Just below the



Modeled after a full-size Volvo truck, the rig's exterior is very well detailed; it features a sun visor, windshield wipers, a grill, chrome rims, a spare tire, trailer support legs, fenders, mud flaps and more! The cab section also has a completely finished interior. As you can see, the graphics on the side are just incredible.



Under the cab, there's a lot going on. A small circuit board and two microservo motors are squeezed into a tiny space. One motor drives the rear wheels through a gearbox. Instead of using a conventional servo for steering, the parts that make up the servo (motor, circuit board and gear train) are assembled inside the cab to most effectively use the little space that is available. Both gearboxes have a small plastic cover to keep out debris.

IS IT FUN?

After a few hours of charging the truck's batteries, I cleared off my desk to make a test track (hey, they call it a Desk Runner, after all). Thanks to the truck's fully proportional throttle and steering, I was easily able to navigate my desk and reverse the truck into the "all-night diner" (my stapler and a box of business cards).

With the office lights dimmed, the truck was even more fun: the itty-bitty turn signals cracked me up every time. Just about the only thing that prevents the Desk Runner from being the perfect lunch-break office toy is its price: at 8 inches long, the truck costs about \$65 an inch. But it does come with a radio!



on and off; the middle one turns operates the hazards, and the right button controls the high beams. Steering trim, auto-drive and "demo" buttons are beneath the wheel; with a push of the demo button, the truck will give a short demonstration of its capabilities. Auto drive is especially cool: it will record a series of the truck's moves and then repeat them at the touch of a button. The small display area on the top of the controller lets you know which function you are using.

ACTUAL SIZE



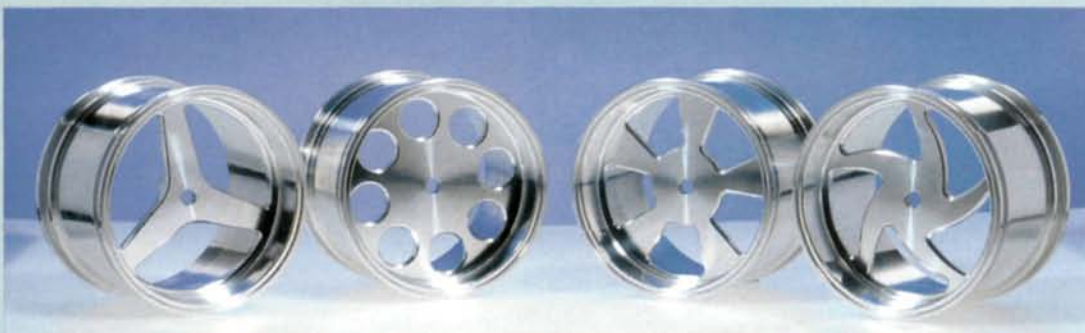
headlights are yellow turn-signal LEDs; just hit the side of the steering wheel on the controller and the turn signal flashes. Just like a full-size truck's, the signal is automatically turned off when the steering wheel is turned (it also has a hazard function). As you might expect, there are taillights and brake lights, too.



We have a little theme action going here; all these goodies are for the Traxxas T-Maxx.

Aerotech rims

Aerotech® has rims for your T-Maxx that will make it stand out from the crowd. They are machined out of solid aluminum billet and are offered in four styles: Directional (TM001), Modular (TM002), Tri-spoke (TM003) and Concept (TM004). The rims' edges have been radiused for a smooth look and finish.



Pro-Line tires

T-Maxx aftermarket hop-ups started to flood hobby shops as quickly as machinists could whip out their calipers, but tire choices have been limited to three choices: stock, stock and stock—until now, that is. Pro-Line® has just added a new T-Maxx tire to its extensive line. The



Maxx Masher is based on the 2.2 Masher 2000 design and is a direct replacement for the stock Traxxas rubber (part no. 1075-00).



Factory Team shocks

Team Associated® now offers a Factory Team shock-upgrade kit for the T-Maxx. You get eight shocks with blue bodies and springs (the blue springs are the same rate as the stock Traxxas springs), a wrench and shock oil. For the Factory Team T-Maxx shock kit, ask for part no. 1600.

Hey, Kev: I have a Tamiya Mad Bison, and I am having trouble with its engine. When I first fire it up, it runs fine, but after a while, it shuts down and I can't get it started. What can I do to solve this problem? [email] HARRY MARK

It sounds as if you might be running the engine too "lean"—not enough fuel to lubricate the engine properly. This will make it run very hot and, eventually, shut down. The engine has difficulty starting again because it's overheating; the piston and sleeve don't fit as they do when running at the operating temperature they were designed for, and this prevents the piston from properly drawing fuel into the engine on its downstroke. The engine simply won't be able to draw the fuel it needs to start and run properly until it has cooled down. When it shuts down, let it cool before trying to start it again. Then, when it is running again, turn the high-speed needle slightly counterclockwise to increase the ratio of fuel to air in the fuel mixture (making it more "rich"); keep "richening" the mixture until the engine runs at the temperature range it was designed for. After it has run for a while, you can check the engine's temp by placing a small drop of water on the cylinder head. If the engine is running at the proper temperature range of 250 to 275 degrees F, the drop should take 3 to 5 seconds to boil off. If it sizzles off right away, your engine is still running too hot.

SHOP TALK

I have a problem with my Traxxas T-Maxx's rear skidplate: as time goes by, it seems to be tearing at the mounting holes. How can I stop this from getting worse?

FRED BRENNER
Chase, MD

Well, Fred, take a look at your truck and you will see that the front skidplate has an aluminum brace between it and the bulkheads. The rear plate does not have this brace, so when your truck is hit hard, the force works to separate the bulkheads, and this is the cause of your problem. To solve it, buy a front skidplate, which comes with an aluminum brace, and install the brace in the rear of your truck. Aluminum bulkhead braces are also available from GPM and Trinity.



If you have any problems or questions about trucks, or if there is something you would like to see in "4x4," email me at kevinh@airage.com or send your letters to:

"4x4"
RC Car Action
100 East Ridge
Ridgefield, CT
06877-4606 USA

*Addresses are listed in "Featured Manufacturers" on page 224. ■

Fix Flameout

... and other problems that occur when good engines go bad by Peter Vieira

It can happen to anyone—and any engine. Your once reliable powerplant suddenly refuses to start, or stay running, and you can't figure out why. You're no dummy; the glow starter is charged, there's fuel in the tank and the glow plug is good. What's the problem? Those gremlins can be tough to catch, but they usually aren't hard to fix. Chances are, you'll find your answers right here. And if the fix is so simple that all you can do is give your best Homer Simpson "Doh!," don't worry; we won't tell anybody.

Fuel system

Some engine problems don't involve the engine at all. Check out the fuel system first!

- If your engine was fine when you took it out of the car but it won't start after you've put it back in, check the fuel lines. You didn't happen to install the pressure line from the pipe to the carburetor instead of the fuel tank, did you? If you did, that's definitely the source of your won't-start problem. Fix it before someone sees it and makes fun of you.
- Did you equip your car with a fuel filter? Good move. Do you check it frequently? I see you nodding, but I bet you haven't checked it recently. If your fuel filter has filtered anything out of your fuel, that junk is stuck in it. Get enough stuff in there, and the filter will

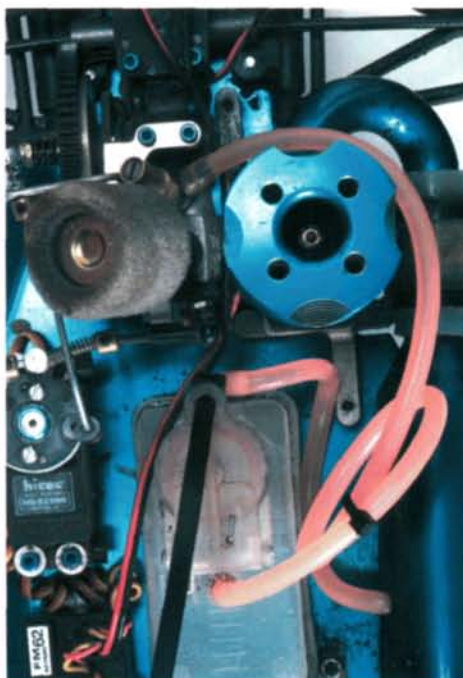


Check your fuel-filter screen frequently; it should be clear of debris like the filter shown here.

be sufficiently clogged to choke off the engine. Sure, it may start, but once you're on the gas and need more fuel flow, it will die. Clean the filter! Another tip: if your filter is one of those primer-equipped types with a squeeze bulb, make sure that you install it facing the correct way, or the built-in one-way valve won't let fuel flow through it.

- Use fresh fuel. If your fuel bottle spent the winter on the garage floor, dispose of it responsibly and get a fresh gallon.

- When in doubt, install new fuel tubing; all it takes is a tiny pinhole leak to make your engine run erratically, and new tubing is cheap insurance. You should also consider sealing the hole and removing the fuel tank's push-button primer, if it is equipped with one. Those primers can leak, too.



What's wrong with this picture? Take your time. Did you figure it out? Notice the fuel lines; they're hooked up incorrectly. The pressure tap is routed to the carburetor instead of to the pipe, and the fuel outlet is routed to the pipe instead of to the carburetor.



Always keep extra fuel tubing in your pit box. When in doubt, swap it out.

Carburetor

The carburetor delivers the air/fuel mixture to the cylinder, so any problem here will spell certain trouble for the engine's reliability and ease of starting. For basic needle-tuning advice, consult your car or engine manual (or pick up the latest issue of Radio Control Nitro!).

- First stop: the idle setting screw. Remove the air filter so that you can look into the carburetor bore, and then close the throttle. Even with full brake applied, you should be able to see a small opening in the carb bore. If the idle-setting screw has backed off (or fallen out), the carb will close completely and kill the engine whenever the throttle returns to neutral or brake is applied. Adjust the idle-setting screw inward so the carb remains slightly open, even with full brake applied. Make the final adjustment with the engine running.



If this is what you see (top) when you peer into your carburetor, your problem is definitely an incorrect idle setting; the engine will shut down as soon as the throttle is closed. The carb should have an opening of about 1mm or so, even with full brake applied (bottom). Adjust the opening with the idle-setting screw (arrowed).





• OK; the idle setting is fine, but how's that air filter? Some filters, such as the paper-element filters included with the RC10GT, are "open" only on one side and will not allow air to flow through if installed upside-down. Foam-element filters are generally goof-proof, but don't think any old hunk of foam can be used as a filter. I've actually seen guys try to use a piece of tire foam as an air filter. The foam doesn't breathe well enough, and it prevents the engine from running. Stick with a genuine RC air-filter element, and keep it clean.

Stop! If you plug the air filter into place upside-down, the engine will never be able to breathe. Make sure the opening faces into the carb.

Clutch

If your engine quits whenever you hit the brakes but your idle setting is correct, check the clutch. The clutch must disengage at idle, or it will stall the engine.

• To test the clutch, spin the clutch bell with the spur gear removed. If it doesn't spin freely, that's a problem.

You may have a broken or missing clutch spring, an out-of-round clutch bell, or incorrect or improperly installed clutch shoes.

• If all the internal clutch parts check out, look to the clutch bearings; one or both may be frozen. One-piece, plastic-cage needle bearings are especially prone to failure. Replace any bearings that are hanging up.

• With the flywheel fully tightened, check the crankshaft for end play. If the play is excessive (more than a "tick"), the crankpin (the part the connecting rod spins on) may be contacting the backplate and causing the engine to stall. Reinstall the flywheel, making sure the collet is as far down on the crankshaft as it can go, and make sure the backplate's sealing gasket or O-ring is in place. If the gasket is left off, the backplate may protrude too far into the engine, and the backplate won't be properly sealed.



These shoes show excessive wear caused by constantly rubbing on the clutch bell. Even at idle, the clutch shoes were dragging the bell, and that caused the engine to quit whenever the throttle was chopped.



The small step in the backplate is for piston-skirt clearance. If the backplate is installed in any other position, the piston will jam. Note the star pattern on the backplate; the connecting rod was contacting the plate, causing the engine to stall. That's what made this good engine go bad!

Inside the engine

Since we're going on the premise that your engine ran terrifically yesterday but terribly today, we'll assume that excessive wear or abuse is not the problem and that all the internal parts are in an acceptable condition; but we won't assume they're assembled properly!

• If you just reassembled your engine and now the crank is jamming against something inside the case, check the backplate; there's usually a relief for the piston skirt that must face upward. If the backplate is installed upside-down, the piston will not be able to reach bottom dead center.

• Make sure the piston is facing the proper direction in the sleeve; it may have a port that must line up with ports in the sleeve. This is a good time to congratulate yourself for saving the manual that came with your engine, since it probably has a schematic drawing that shows the correct piston orientation.

• If your engine only has a pair of marks instead of an indexing pin to align the sleeve in the case, be certain the marks on the sleeve and case are lined up precisely.

• Seal everything. Air leaks will make your engine run erratically and will thwart your tuning efforts. Use Permetex Ultra Copper sensor-safe sealant (available at automotive stores) to seal the carburetor mount, the main needle's banjo fitting and the backplate.



A little Permetex Ultra Copper sealant can greatly increase the reliability of your engine. You don't have to slather it on; use just enough to coat the mating surfaces where the carb, backplate and banjo fitting join the engine.



Always check the sleeve alignment before you button down the heat-sink head. This engine has a pin that fits into a notch in the sleeve, so alignment is a no-brainer.

That should do it! Your engine should be its reliable old self again. If you've encountered any weirdness that isn't covered here and have a fix you think might help your fellow readers, drop me a line at peterv@airage.com. ■

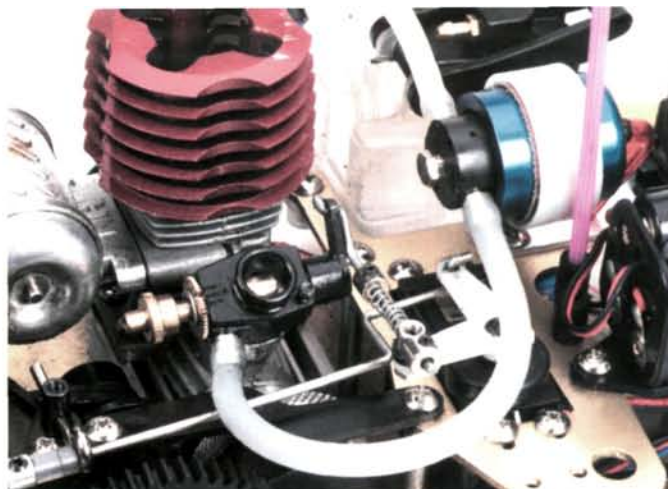
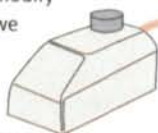
Fuel pump engine mod

In the August edition of "Piston Power," called "Pump it up," I told you about Conley Precision's* fuel-pump system, and you guys loved it. Some of you, however, did a bit of whining, which went something like this: "Yeah, sure, Chris; tell us about the virtues of positive fuel pressure to the carburetor, but don't tell us how to modify the engine so we can install the pump system. Gee, thanks a lot." OK, look: it may have taken me two issues, but here's how to do it. See? I do the right thing. You guys know me—have a little more faith.

Now remember; when you've completed installation and are ready for the first start-up, fuel will no longer be sucked into the carb—it is now being pushed in. If you open up the needle too much, you will flood the engine. This positive pressure will also make mixture adjustment much smaller in terms of needle turning. Have fun, drive fast, don't crash!



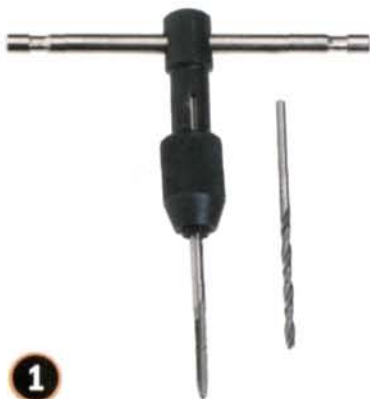
Left: Conley carburetor with adapter. Conley makes an aluminum adapter for every .12, .15 and .21 engine manufactured.



This is a typical installation for the Conley fuel pump system. If your original carb was a slide type, an optional bellcrank may be needed to adapt to the Conley rotary carb. If the original was a rotary carb, replacement will be easier. Keep the pump unit and all lines, especially the one leading from the engine to the pump, away from exhaust system heat.

The tools you'll need: a 6-32 tap, a tap wrench, a no. 35 drill bit and an electric drill.

Note: Before you start, decide on pump placement which will dictate pressure-fitting placement on the engine.



1

When you begin, it's extremely important to cut a little at a time and to add oil a few times during the process. Thread cutting is done $\frac{1}{8}$ to $\frac{1}{4}$ turn at a time. Cut a little by turning clockwise, and then turn the tap counter clockwise to release the cuttings. It's a back-and-forth process, working your way into the hole till the threads have been cut through entirely. It just takes a little patience.



4



2

The pressure fitting is easier to install on a non-pull-start engine than on a pull-start type. Simply remove the backplate, and use the no. 35 drill to drill a hole in the center of the backplate.



5

Screw in the fitting, tightening it gently. Aluminum threads can't take much torque. Thread-lock—any type—will hold the fitting in place while also sealing the threads.

6



With backplate installations, any protrusion of the fitting will have to be ground off flush with the backplate's inside surface to eliminate interference with connecting-rod operation.

7



Ready to be installed in the car and plumbed to the pump.

A little more work is involved with a pull-start engine since backplate-fitting installation is not possible.

Remove the recoil mechanism and shaft plate. The fitting can be placed on either side of



8

the engine case. The crankpin must be placed on the side opposite to that where the drilling is to take place, and the piston skirt (piston bottom) must not be visible below the lower edge of the cylinder. Here, the fitting will be installed on the left side of the engine, as viewed from the rear.

9



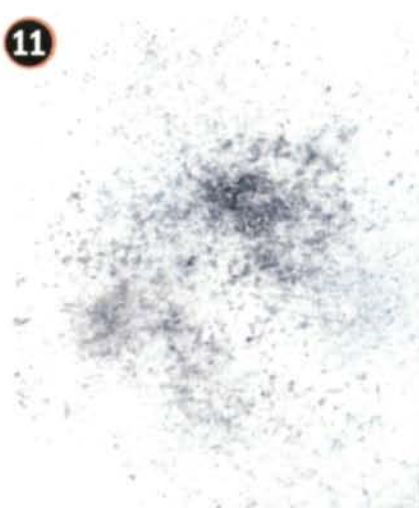
Using the fitting as a guide, mark the hole location on the crankcase with a smaller drill. This is important because if the hole is placed too close to the mounting flange, the hex-nut part of the fitting will interfere with the flange.

10



When you perform the drilling, do it with the crankshaft pointing to the sky so that filings fall out of the engine, not into the crankshaft ball bearings.

11



If you didn't pay attention to step 10, here's what just fell into your engine's expensive ball bearings. This stuff will turn your bearing to toast. So pay attention!

12



Again, go gently as prescribed in photo no. 4. Cut a little at a time, and don't forget the cutting oil.

13



When the tap is completely cut through but before you remove it, douse the engine's insides—and the tap—with denatured alcohol, and then blow out the filings with motor spray or WD-40. Again, do this with the crankshaft pointing to the sky.

14



With a crankcase installation, the end of the fitting does not protrude so no grinding is needed. Don't forget the thread-lock to keep everything sealed and secured.

15



Inset: this nylon bracket is supplied with the system. It makes mounting the cylindrical pump in a number of places easy.

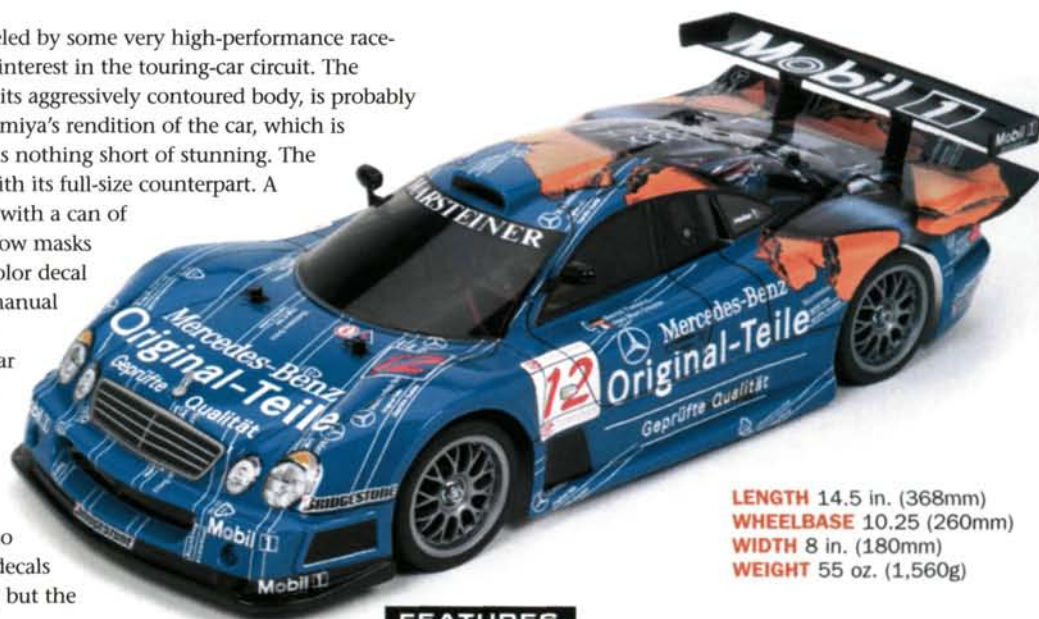
Pump to engine mod completed. Always use the included hard tubing for this application. Do not replace this line with standard fuel tubing; its softness will not transmit the crankcase pulses properly to the pump's diaphragm.

If you still have reservations about performing this engine modification, Conley Precision will perform the procedure for you for the extremely low-price of \$20 including shipping. Contact them at Conley Precision Engines, 825 Duane Street, Glen Ellyn, IL 60137. (630) 858-3160.

*Addresses are listed alphabetically in "Featured Manufacturers" on page 224. ■

Tamiya Mercedes CLK GTR by Kevin Meyer

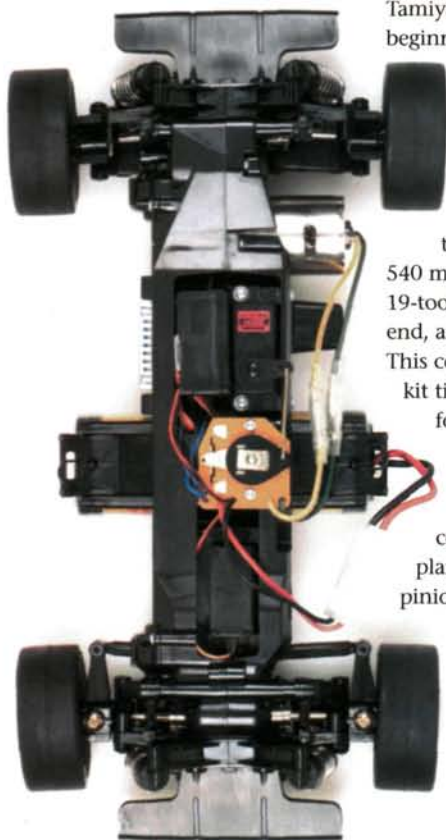
The GTR class has been fueled by some very high-performance race cars, sparking even more interest in the touring-car circuit. The Mercedes CLK GTR, with its aggressively contoured body, is probably the most eye-catching. Tamiya's rendition of the car, which is included with the latest TL01 kit, is nothing short of stunning. The shell is matched curve for curve with its full-size counterpart. A scale finish can easily be achieved with a can of blue paint, and the included window masks help cut finishing time. The full-color decal sheet is the kit's high point. The manual shows the exact placement of the more than 100 decals. Over the rear window, the graphics depict torn-away body panels that reveal a highly detailed Mercedes power-plant underneath. One-piece rims and a large rear wing also add to the authentic look. You'll no doubt spend more time applying decals than you will building the chassis, but the results are worth every minute!



LENGTH 14.5 in. (368mm)
WHEELBASE 10.25 (260mm)
WIDTH 8 in. (180mm)
WEIGHT 55 oz. (1,560g)

PERFORMANCE

Tamiya's TL01 chassis is an ideal beginner machine; once the kit is assembled, basically no maintenance is required. The TL01 makes a great play car for lunchtime at work, and the gorgeous Mercedes shell is bound to attract a crowd. The stock 540 motor with the included 19-tooth pinion has adequate top end, and run times are very good. This combination doesn't give the kit tires much of a workout, but for parading the pretty body around, it's all you need. To make things more exciting, just drop in a competition stock powerplant, add a few teeth to the pinion gear, and you'll be buzzing right along. When you've finished playing, just dust off the chassis and put it away. Overall, another great scale effort from Tamiya.



REQUIRED ACCESSORIES

- 2-channel radio and receiver.
- Two servos (or one servo and an ESC).
- 6-cell stick pack and charger.
- Polycarbonate-compatible paint.
- Polystyrene (plastic) paint for rear wing and mirrors.
- Tire glue.

FEATURES

- Shaft-driven 4WD.
- Super-detailed body kit.
- Metal-gear differentials.
- 3-step mechanical speed control and 540 motor.
- Friction-type shocks.



*Addresses are listed alphabetically in "Featured Manufacturers" on page 224. ■

CS electronic Motor Dyno

There are lots of ways to increase a motor's performance but only one way to quantify its performance: by checking it on a dynamometer (dyno, for short). A motor dyno can shed light on why you get smoked on the straight or your motor overheats, and it lets you record your motor's "like-new" power output so you'll later be able to see how this has changed with use. Unfortunately, dynos are expensive; you can pay close to \$1,000 for a good one. A new dyno—the PowerCheck from CS electronic (imported by Schumacher USA*), has a long list of features and costs about half as much as similar units. Does it work as promised? I'm glad to say it does; here's what you get.

FEATURES

- **Inertial testing.** To determine a motor's torque and power, the dyno uses calculations based on the flywheel's inertia. To greatly simplify things, the dyno measures how long it takes the motor to accelerate the flywheel to maximum rpm, then it calculates—using acceleration time, amp draw and voltage figures—to determine the motor's torque, power in watts, efficiency and other performance parameters.

- **Battery-powered motor operation.** The PowerCheck operates off a 12V power supply and requires a 6-cell Ni-Cd pack to power the test motor. By using an RC battery to power the motor, CS reduces the cost of the PowerCheck by eliminating the need for an expensive internal power supply that can handle the high-amp draw of modified motors. The only downside is a certain inconsistency in results when you test a motor over a long period. Since battery-pack performance changes with age and use, the numbers you get on a motor today may not be directly comparable to those you obtain a few months down the road if you power the dyno with a different battery. Even if you use the same battery for the retest, your results will be skewed if that pack has also seen active race duty since it was first used to power the dyno. But most motor builders are interested in single-session numbers and not in long-term tests, so this is a minor problem. If you can spare a pack exclusively for use in the dyno, that's your best bet.

- **PC-compatible.** The PowerCheck is a stand-alone unit and will show peak values for horsepower, efficiency and other parameters on its built-in display. For those who want more information, CS supplies software and all the necessary peripherals to link the dyno with your PC. The software is easy to use and has two display



Very compact and easy to use, the CS PowerCheck gives you an edge in the motor-tuning department.

modes: table mode displays the data in columns and rows; graphic mode displays a line graph of all the measured performance parameters. The PC link is also invaluable for saving and comparing motor data; results for an entire run are clearly displayed and can be saved for reference, and the graphs can be set up to display several motor readings for comparison.

- **LCD display.** When not used with a PC, the PowerCheck's two-line dot-matrix display provides test information. It's easy to read and can be accessed by scrolling down.

In stand-alone mode, the PowerCheck displays three basic screens:

- maximum rpm, efficiency and power (watts);
- power (watts), amps, rpm and torque values measured when the

In this photo, you can clearly see the flywheel, which is surprisingly heavy and takes at least 15 seconds to spool up. An optical sensor sees the black and white and calculates the data from what it sees.

motor is operating at maximum efficiency;

- the same parameters' values at maximum power.

After you've run the dyno, the first display tells you maximum rpm, efficiency and power.

```
MAX: 40622 RPM
79.0% 191.5W ↓
```

Press the "down" arrow to obtain data at maximum efficiency; this information is key to gearing your motor for extended run times.

```
79.0% 124W 24A ↑
32414 36Nmm ↓
```

Press the "down" arrow for data at maximum horsepower. Combine the data from all three screens and watch the lap times diminish as run time and speed are maximized.

```
191W 60.6% 59A ↑
20422 89Nmm ↓
```

What the PowerCheck will tell you

New motor tuners are often seduced by manufacturers' big numbers and they rely on maximum rpm and power figures to determine which motors are fastest. Though this type of information is useful, experienced tuners know that the relationships between power, rpm, torque and efficiency are the true measures of performance.

To satisfy these tuners, the PowerCheck's manufacturer gives the usual "maximum" readings but also shows how the reading changes when measured against its performance counterpart. For example, the dyno indicates maximum power but also shows how much power the motor has when operating at best efficiency.

- **Maximum rpm/rpm at max efficiency.** This is useful when estimating the correct gear ratio for a track. It's tempting to assume that the motor with the highest rpm is the fastest, but if the motor is very inefficient at max rpm, you won't be able to exploit that speed. By indicating the rpm at max efficiency, the dyno gives a truer picture of performance.

- **Efficiency/efficiency at max power.** This is determined by the ratio of power going into the motor versus the power generated by the motor. The efficiency of a motor varies throughout its rpm range; the PowerCheck will tell you at which rpm a motor runs most efficiently. You should shoot for a gear ratio that keeps the motor turning close to maximum efficiency.

- **Power/power at max efficiency—also known as horsepower;** the higher the maximum power value, the faster the motor obtains maximum rpm and the more work it is capable of. But don't forget to check the power at max efficiency; if your powerhouse motor is a dog when geared to run 5 minutes, that big "max power" number will be good only for benchtop bragging rights.

- **Rollout.** A rollout calculator is a feature of the PC software. The calculator can determine the final drive ratio by inputting the pinion/spur-gear ratio, transmission ratio and tire size. The distance traveled per revolution of the motor (rollout) is given in millimeters. You could get the same info by doing the math on the back of a pizza box between heats, but it's much easier just to plug the numbers into the software.

• **Carrying case.** Inside the convenient protective carrying case, you'll find a handy tool case for wrenches, brushes and any other tuning tool you might need. The unit comes with Allen wrenches for both pinions and motor screws. A parallel port plug, motor screws, Allen wrenches and thumbscrews are all neatly stowed in the case.

OPERATION

The PowerCheck is easy to use. After you've removed it from the carrying case, connect it to the required 12V power supply and attach a 6-cell pack to power the motor. The illuminated screen displays an internal self-check, and then it's ready to go. To prepare a motor for testing,

bolt it to the mounting plate, and then fit a flywheel to the motor shaft. The assembly is attached to threaded posts in the top of the dyno and secured via thumbscrews. Since the flywheel fits inside the dyno case, an external flywheel shield isn't required. Now attach the power leads to the motor (they just clip on), and press "Start." The motor spools up and winds down, and then the PowerCheck displays its data; the process takes about 10 seconds. If there is a problem, low battery voltage, for example, the run is aborted and an error message is displayed on the PC and the PowerCheck. When hooked up to a PC, the dyno is completely controlled via the keyboard. After each run, you can toggle between the graph and a table that shows maximum-value data, and the information can be stored with the file name of your choice.

THE VERDICT

If you are serious about racing and have decided to add

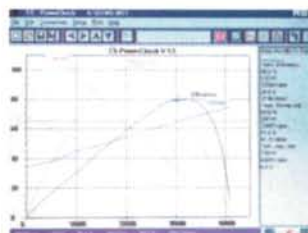


The components needed to run the PowerCheck in stand-alone mode. The power supply powers only the dyno, and the battery powers the motor during the test.

a dyno to your pit bag, the CS electronic PowerCheck should definitely be on your shopping list. Its small, all-in-one design makes it very portable

(assuming you plan to take a power supply to the track), and it shows the most useful data for motor tuning and gearing selection. With the addition of a PC, the PowerCheck can get you even farther inside your motors' performance capabilities. The PowerCheck also stands out in value; at about \$400, it costs half as much as systems that generate similar data.

—Derek Buono



With the included software, the PowerCheck can be linked to a PC for an excellent graphical display. Use it to store and compare data with the click of a button.

Likes

- Can be used as a stand-alone or with a PC.
- Compact, so it doesn't take up a lot of space.
- Easy to use.
- Relatively inexpensive.

Dislikes

- Using a 6-cell pack as the power source for a motor may skew long-term comparisons.
- Requires a separate power supply and a 6-cell pack for operation.

OFNA CNC 2-way Engine Mount

This engine mount from OFNA* looks good, offers loads of adjustability and also helps cool your engine slightly. Attach the round lower rails to your HPI or Tamiya touring-car chassis with the included screws and countersunk washers, then bolt the engine to the upper anodized heat-sink mount. Being able to just slide the engine out of the way will help you make short work of any clutch or gear changing. We found that the engine mount was easy to install and worked as promised. Part no.—37957. Price—\$22.95.



Dynamite Ni-Charge

If you've ever had to stop running your nitro rig because your glow igniter died and you were out in the field without AC power to recharge it, then you need Dynamite's* new Ni-Charge. The DC-powered unit hooks up to any 12V power source and delivers a 600 to 1000mAh charge for 20 minutes; a green LED indicates the unit is receiving power, and a red LED indicates it is charging. The Ni-Charge's two lower tabs make it convenient to mount the unit directly onto a starter box. You'll be twiddling your thumbs for 20 minutes while you wait for the glow starter to charge, but at least you won't have to pack up and go home! Part no.—DYN1920. Price—\$16.95.



Racers Edge Tie Wraps, Antenna Caps and Grip Clips

Here are some colorful and functional accessories from Racers Edge*. The medium-size, neon tie wraps are perfect for strapping down your electronics; the single-use ties are 7½ inches long and extremely strong. The antenna caps are sold in a 10-pack assortment of pink, yellow and black, and we found that the thin material doesn't snag as easily when the body is removed. The new Grip Clips feature an exaggerated bend that "locks" the clips to the body posts. Part nos.—RE5607M (tie wraps); RE1002M (antenna caps); RE1085 (Grip Clips). Prices—\$2.90; \$1.75; \$1.10.



TRACKTEST HPI RS4 Sport 2

Continued from page 83

As I mentioned before, the racing slicks are keepers, but they didn't offer maximum grip until they were scuffed a bit and had warmed up. My tests on a vacant asphalt parking lot showed some push when cornering, and this made the car forgiving to drive; nothing is more frustrating than a car that spins out easily. Not that I couldn't spin the car—that's what brakes are for. The RS4 Sport 2 was more than happy to indulge hard-braking spinouts and other just-hacking-around moves, and the 4-wheel slides I enjoyed on the carpet were just as easily achieved on asphalt with a tap of the brake. A little softer front spring, or even just a slightly lower front ride height (or taller rear ride height) would tighten up the steering, but I was having too much fun tossing the car around to worry about tuning it.

THE VERDICT

Whether it's your first kit ever or just your first venture into the touring-car class, the HPI RS4 Sport 2 gives you an excellent start at a very fair price. In addition to a high-quality chassis with excellent performance, the Sport 2 includes some of the best bodywork in RC (you can get an Altezza like mine, or opt for a Civic Si, Porsche 911 or Dodge Stratus). With Pro 2 geometry and bearings in the box, you won't have to re-spend half the price of the kit to get a high-performance car, and if you want to race, the Sport 2 will be a capable partner.

* Addresses are listed alphabetically in "Featured Manufacturers" on page 224 ■

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Hobbytown USA Raceway, 450-Q Schillinger Rd. N., Mobile, AL 36608; Rob & Kari Baker, (334) 633-8446

Lagoon Park R/C Raceway, 2730 Lagoon Park Dr., Montgomery, AL 36109; Alex Love, (334) 272-6438

Montgomery's Field of Dreams, 5924 Ralston Way, Montgomery, AL 36116; Mike Westendorf, (334) 281-9432; mike_westendorf@yahoo.com

Phenix Raceway & Hobby, 2006 Opelika Rd., Phenix City, AL 36867; Chris Watson, (334) 298-9786; http://www.xoom.com/PhenixHobby

R/C Hi-Tech Raceway, 3303 Meridian St., Huntsville, AL 35811; Rick Chambers, (205) 539-1347

R/C Thunder Tracks, 1530 Schillinger Rd., Mobile, AL 36675; for mail, use 8125-2 Moffett Rd., Semmes, AL 36575; Jerry Hurst, (334) 645-2787

ALASKA

Fairbanks R/C Car Club, 510 Juneau Ave., Fairbanks, AK 99701; Dan Anderson, (907) 456-5494

ARIZONA

Craft Barn Raceway, 11200 E. Hwy. 95, Yuma, AZ 85365; Matt Poston, (520) 726-1946

Hobbytown Raceway, 1102 E. 22nd St., Tucson, AZ 85704, (520) 882-8888

HobbyTown U.S.A., 5030 E. Ray Rd., Phoenix, AZ 85044; Linda McFarland, (480) 598-5282

Kiwanis Park R/C Raceway, 855 S. Magnolia Ave., Yuma, AZ 85364; Jim Schulz, (520) 783-5378

R/C Sports Mania, 3550 N. 35th Ave., Phoenix, AZ 85017; Brian Dick, (602) 278-3671

Scottsdale R/C Raceway, 3023 N. Scottsdale, Scottsdale, AZ 85251; Scott Anfinsen, (602) 945-2186

Speedway Hobbies, 2710 N. Steve's Blvd., Ste. 8, Flagstaff, AZ 86004; Gary McAllister, (520) 714-1566

ARKANSAS

Airport Speedway, 1521 Airport Loop, Rogers, AR 72756; Mike Dollar, (501) 636-7123

Grand Slam Superspeedway, 5300 S. Zero St., Ft. Smith, AR 72901; Bryon Shumate, (501) 648-1994

Hobby Town USA, 356 E. Joyce, Fayetteville, AR 72703; Darrell Irvin, (501) 571-3730

Sparks R.C. Raceway, 7194 Greene 721 Rd., Paragould, AR 72450; Tommy Sparks, (501) 239-3606

CALIFORNIA

Asphalt Burners R/C Club, 21000 Imperial Hwy. and Harbor Blvd., La Habra, CA 90631; (562) 691-1409; www.asphaltburners.homepage.com; rc-racer@email.com

California R/C Raceway, 1230 N. Kramar, Anaheim, CA 92806; Taka, Sid, or Charlie, (714) 630-9300

Castle Hobbies, 14918 Camden Ave., San Jose, CA 95124; (408) 377-3771

Delta R/C Speedway & Hobbyshop, 1201 W. 10th St., Antioch, CA 94509, (925) 778-2965

Desert Hobbies, 28-401 Date Palm Dr. Cathedral City, CA 92234; Mike Beall, (760) 202-8225

The Dirt Valley RC Racepark, 146 So. Santa Fe St., Hemet, CA 92343; Joe Christensen, (909) 925-7592

Gooch Raceway & Hobbies, 115C N. Chevy Chase Dr., Glendale, CA 91206; Devin Last (818) 562-2380, fax (818) 242-0525

Hobby Central II Raceway, 13461 Community Rd., Poway, CA 92064; John, (858) 513-0373

Hot Rod Hobbies, 25845 San Fernando Rd., #21, San Jose, CA 91350; Rod Weisbaum, (805) 255-2404

Jake's Performance Hobbies, 6650 Commerce Blvd., #21, Rohnert Park, CA 94928; Jake, (707) 586-3375

Just for Fun R/C Raceway, 509 S. State St., Ukiah, CA 95482; Don, (707) 462-7305

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Paradise Hobbies, 491 Pearson Rd., Paradise, CA 95969; David Lafabregue, (530) 877-6477; fax (530) 873-2377

Racer's Haven Raceway, 7401 White Ln., #12, Bakersfield, CA 93309; Martin Buchanan, (805) 835-0441

Rams 1/8-scale Gas and 1/16-scale Gas On-Road, Mission College, Lot B, 3000 Mission College Blvd., Santa Clara, CA 95054-1897; Steve Tsuruda, (415) 675-5609

Rattlesnake Raceway, 16470 Benson Rd., Cottonwood, CA 96022; Mel or Mike Fisher, (530) 347-7215; email: rc-geezee@webtv.net; website: http://members.xoom.com/CAR-RCORR/Race.html

Rescue Mini Speedway, 4018 Green Valley Rd., Rescue, CA 95672; Bruce Pease, (530) 621-3948

Ripon R/C Speedway, 701 N. Acacia Ave., Ripon, CA 95366; Dan Tanis, (209) 599-5160

R.O.C.K.S., 2525 N. Texas St., Fairfield, CA 94533; Mike, (707) 207-0305; http://members.aol.com/solanorock

Sacramento RC Racing and Hobbies, 6201 27th St., Sacramento, CA 95824; Andreas Muller, (916) 424-4001; email: andreas123@earthlink.net; website: www.77sunset.com

Simi Valley Groundpounders, 392 C - East Easy St., Simi Valley, CA 93065; Jack Kasten, (805) 584-8211

So. Cal R/C Raceway, 19118 Brookhurst St., Huntington Beach, CA 92646; Jim Blauvelt, (714) 963-7484

Speedworld Raceway, 90 Corporation Yard Rd., Roseville, CA 95678; Billy Bowerman, (916) 783-8864

Ultimate Hobbies, 2378 North Orange Mall, Orange, CA 92665; Cliff Murukami, (714) 921-0424

Valley West Off-Road RC Club, 447 30 1/4 Rd., Grand Junction, CO 81504; Waymond Williams, (970) 242-8846

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Hobby Stop Speedway, RD4, Box 100, Rte. 13, Seaford, DE 19973; Remy Haynes Jr., (302) 629-3944

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Means R/C Raceway, 150 Pondell Rd., North Fort Myers, FL 33903; Pete Gonzalez, (941) 772-2251; email: jaimewootton@worldatt.net; http://members.xoom.com/wootj

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KEY TO SYMBOLS

	Indoor		Concrete
	Outdoor		Asphalt
	Off-road		On-site hobby shop
	Oval		AC power
	Dirt oval		Auto lap counting
	Carpet		Food available

Sand Dollar Speedway, 1900 S Hwy 87, Suite I, Navarre, FL 32566; Jim or Bev Patterson, (850) 939-8788; sanddollarspeedway@aol.com; http://members.aol.com/sanddollarspeedway/index.html

FLORIDA

Santa Cruz Race Track, 8150 NW 71 St., Miami, FL 33166; Maxy or Eric, (305) 471-8133; email: maxy@iamnet.com; web: www.danshobbies.com

FLORIDA

South Daytona R/C Raceway, 2121 S. Ridgewood Ave., South Daytona, FL 32119; Mike Bean, (904) 426-6481

FLORIDA

South Palm Beach Racers, South County Regional Park, West Boca Raton, FL 33486;

Mike Fazio, (561) 338-5367

FLORIDA

Superior Hobbies R/C Parking Lot Racing, 1478 Semoran Blvd., Casselberry, FL 32707; Rob Michael, (407) 834-9299; www.superiorhobbies.com; racing@superiorhobbies.com

FLORIDA

Tampa Bay R/C Club, P.O. Box 10224, St. Petersburg, FL 33733; Dick Gillette, (813) 526-0744

FLORIDA

University RC Speedway, 8475 Cooper Creek Blvd., University Park, FL 34201; Mike Boylan, (941) 358-7047

FLORIDA

Warehouse Hobbies, U.S. Rt. 27 South, Winterset Motel, Sebring, FL 33872; Tony and Pam Castronova; (941) 699-1231

FLORIDA

GEORGIA

Anthony's Victory Lane, 129 East Hwy 80, Pooler, GA 31322; Anna Stephens, (912) 748-0847

GEORGIA

Bullet Raceway and Hobby, 3735 Old Flowery Branch Rd., Oakwood, GA 30566; Mark Taaffe, (770) 534-9229

GEORGIA

Dalton Raceway, 3036 Parquet Rd., Dalton, GA 30720; (706) 226-6699

GEORGIA

Echeconnee Superspeedway, 2149 Richardson Dr., Macon, GA 31206; Andy Thompson or Cliff Kline, (912) 788-8731

GEORGIA

Emerald City R.C. Speedway, Highway 40 East, East Dublin, GA, 31021; Terry Cook, (912) 272-3856

GEORGIA

The Flight Box Hobby Shop, 3134-C Rockmart Rd., S.E., Rome, GA, 30161-6826; Leslie Duke, (706) 234-3014

GEORGIA

Hobby Town Raceway, 2301 Airport Thruway, Columbus, GA 31904; Frank Bastos, (706) 660-1793

GEORGIA

Phil Hurd Raceway, 15 W. York Ln., Savannah, GA 31401; J. Filipow, (912) 232-9985; jfilipow@scad.edu

GEORGIA

Prime Time Hobby and Crafts, 432 South Wall St., Calhoun, GA 30701; Vicky or Tommy, (706) 625-9037; www.rcracing.com

GEORGIA

The Racer's Edge, 1530 Hwy. 19 N., Thomaston, GA 30286; Roger or Mark Walls

GEORGIA

Sandy Cross Speedway, Rt. 1, Box 1071, Hwy. 51, Royston, GA 30662; Morris Phillips or Wayne Fowler, (706) 245-9573

GEORGIA

Shiloh R/C Raceway, 6362 Shiloh Rd., Hahira, GA 31632; Doug Burnett, (912) 794-2507

GEORGIA

Stinger RC Super Speedway, 3769 Maysville, Rd., Commerce, GA 30529; Deric Sauls, (706) 335-5006 or (706) 335-9044

GEORGIA

Sugar Bowl R/C Speedway, 5272 Nelson Browning Blvd., Sugar Hill, GA 30518; Shelley Bailey, (770) 945-6709

HAWAII

HAWAII

Garden Isle R/C Racers, 5855 Ahakea St., Kapaa Kauai, HI 96746; Arnold Morales, (808) 823-0856

HAWAII

Kakaako Water Front Park Dragway, 98-029 Hekaha St., Bay #32, Alea, HI 96701; James Inkyo, (808) 487-5155

HAWAII

Maui R/C Racing Association, 230 Hana Hwy., Unit 11, Kahului, HI 96732; Garrett or John, (808) 873-0376, (808) 893-0116, or (888) 646-6687

HAWAII

Pearl City Raceway, 98-029 Hekaha St., Bay 32, Alea, HI 96701; James Inkyo, (808) 487-5155

HAWAII

Radio Control Hawaii, 474 Kalanikoa St., S-104, Hilo, HI 96720; Glenn Shiroma, (808) 935-5629

HAWAII

Team PRC Racing Club, 176 Mamala St., Hilo, HI 96720; Charlie, (808) 935-3561

HAWAII

Triangle R/C Racing, 1870 CR 1600 N. Urbana, IL 61803; Scott Weaver, (217) 469-0121

HAWAII

IDAHO

Almosta Ranch Speedway, 1732 Eldridge Ave., Twin Falls, ID 83301; Casey Clements, (208) 733-8219

IDAHO

Boise Hobby Raceway, 4516 Overland Rd., Boise, ID 83705; Jim, (208) 363-9555

IDAHO

Capital Dirt Burners, 1612 Latah, Boise, ID 83706; Jim Small, (208) 433-1631; Matt Barr, (208) 378-1110

IDAHO

Dirt Stuff Plus, 5344 N. Yellowstone Hwy., Idaho Falls, ID 83401; Brian Krah, (208) 522-7576

IDAHO

ILLINOIS

Adams R/C Raceway, 7201 S. Adams, Bartonville, IL 61607; Ray Tigue, (309) 633-9300

ILLINOIS

AJ's Raceway & Hobby, 10211 Keslinger Rd., DeKalb, IL 60115; A.J. Schultz, (815) 756-2772

ILLINOIS

C.I.R.C.A., 905 Bibbs St., Jacksonville, IL 62650; Sport 'n' Hobby; (217) 245-1375

ILLINOIS

C&R Hobbies, 39 E. Jones, Milford, IL 60953; Ray, (815) 889-4073

ILLINOIS

Depot Hobby Raceway, 180 S. Seminary St., Galesburg, IL 61401; (309) 342-9323

ILLINOIS

H & H Hobbies and Raceway, 9346 Virginia Rd., Lake in the Hills, IL 60102; Mike Hollingsworth, (847) 458-1777

ILLINOIS

HobbyTown Raceway, 2103 N. Veterans Pkwy., Bloomington, IL 61701; Gary Pritts, (309) 664-4451

ILLINOIS

Leisure Hours R/C Raceway, 24121 W. Theodore, Bldg. 1, Plainfield, IL 60544; Scott Hill, (815) 439-1777 (track), (815) 439-1477 (shop)

ILLINOIS

Machesney Park, 1220 Shappert Dr., Machesney Park, IL 61115; (815) 282-1311

ILLINOIS

Marty's R/C Hobby, 1335 E. Broadway, Bradley, IL 60915; Gail or Marty, (815) 933-8441

ILLINOIS

Monroe R/C Raceway, 26049 Ridgeland Ave., Monroe, IL 60449; Roy or Roberta Moody, (708) 534-2422 (track), (708) 799-5597 (office)

ILLINOIS

Outlaw R/C Speedway, 1614 Broadway, Mattson, IL 61938; (217) 234-6229

ILLINOIS

Pontoon Raceway, 3670 St. Rte. 111, Granite City, IL 62040-4304; Pat or Skip, (618) 931-1206

ILLINOIS

Quad Cities Radio Raceway, 541 1st Ave. North, Silvis, IL 61282; Tom Bedwell, (309) 751-9663

ILLINOIS

Radio-Active Raceway, 751 N. Bolingbrook Dr., #15, Bolingbrook, IL 60440; Jim, (630) 759-7557

ILLINOIS

Rector's R/C Raceway, RR 3, Box 104, Albion, IL 62806; Tim Wolfe, (618) 842-9379 (M-F), (618) 446-3282 (Sun.)

ILLINOIS

RMR Raceways, 19091 West Casey Rd., Libertyville, IL 60048; Ron Rawald, (847) 549-6963

ILLINOIS

Shiloh Eagles Superspeedway, 308 N. Virginia Ave., Belleville, IL 62220; (618) 277-6030

ILLINOIS

Stanton Hobby Shop, 4718 N. Milwaukee, Chicago, IL 60630; Kevin Kane, (773) 283-6446

ILLINOIS

Valley Farms R/C Raceway, 706 Bypass 20, Cherry Valley, IL 61016; Dean or Debbie, (815) 332-4516 or (815) 547-5984

ILLINOIS

Wep Speedway, RR #2, Box 44, Lawrenceville, IL 62439; Bill Poe

ILLINOIS

INDIANA

BD R/C Off-Road Racing, 13255 Chippewa, Mishawaka, IN 46545; Betty or Bob, (219) 257-1098; 02kie@aol.com; www.angelfire.com/in/bdrcffroad/index.html

Bremen Racing Ent., 308 N. Bowen, Bremen, IN 46506; Dale Heuberger, (219) 546-3807

INDIANA

The Dirt Yard, 1117 W. Epler Ave., Indianapolis, IN 46217; Keith Dudas, (317) 786-6417

INDIANA

GM Raceway, 1651 W. Franklin St., Elkhart, IN 46516; Pete Russell, (219) 293-1827

INDIANA

Hardesty R/C Raceway, 11 East Plymouth St., Hamlet, IN 46532; Max Hardesty, (219) 867-8600 or (219) 772-6566

INDIANA

Hobby Barn Raceway, 1950 Springhill, Terre Haute, IN 47802-9694; (812) 299-5773

INDIANA

Hobbytown U.S.A., 5385 E. 82nd St., Indianapolis, IN 46250; Bill Scott, (317) 845-4106

INDIANA

Nitro R/C Speedway, 4310 West 400 South, Danville, IN 46122; John Webber, (317) 539-4413; email: nitrocr1@aol.com

INDIANA

P&T Hobbies and Raceway, RR 2 (Hwy. 60), Mitchell, IN 47446; Paul Weber or Tom Logsdon, (812) 849-6666; email: pnthobby@big-foot.com

INDIANA

Race Street Hobbies, 1126½ Race St., New Castle, IN 47362; Jim Burke, (765) 521-4888

INDIANA

RC Barn, 310 N 125 W, Monroe, IN 46722; Mark Lengerich, (219) 692-6600

INDIANA

R/C World of Indiana, 2246 West U.S. Hwy. 36, Lynn, IN 47355; Joe Kolp, (765) 874-2464; e-mail: rcworld@global-site.net; web: www.RCWORLD.com

INDIANA

R/C Mania, 8 Wood Ct., Hebron, IN 46341; Ron Trobaugh, (219) 996-6288 (shop); (219) 762-5365

INDIANA

The Rink, 7900 Whitcomb, Merrillville, IN 46410; Don Reiner, (219) 769-8113

INDIANA

Showtime Lot Racing, 606 Lower Huntington Rd., Fort Wayne, IN 46815; Mike Romines, (219) 478-6099

INDIANA

Summit Area Radio Cars (SARC), 7000 Red Haw Dr., Fort Wayne, IN 46805; John Kissel, (219) 492-2271

INDIANA

IOWA

Delb's Speedway, 423 11th Ave. So., Clinton, IA 52732; Rusti's Miniatures and Hobbies, (319) 243-2697

IOWA

Hobby Haven, 7672 Hickman Rd., Des Moines, IA 50322; Rick Marble, (515) 276-8785

IOWA

IRDA—Hawkeye Downs Raceway, Hawkeye Downs, 6th St. S.W., Cedar Rapids, IA 52404; Dave Kleinschrodt, (319) 556-8524

IOWA

Manly R/C Club, Box 23 (Hwy. 65), Manly, IA 50456; Bruce Hill, (515) 454-2025

IOWA

Mr. Car Raceway, P.O. Box 1112, Central Iowa Fairgrounds, Marshalltown, IA 50158; Jim Gossett, (515) 483-2234

IOWA

Outback Speedway, 108 West Iowa, Greenfield, IA 50849; Helens Enterprises, (515) 747-3064, trackside (515) 343-7004

IOWA

Radio Control Raceway Park, 2100 First Ave. N., Fort Dodge, IA 50501; Bernie Halverson, (515) 576-3780

IOWA

Riverside Raceway, Veteran's Park, Algona, IA 50511; Mike Beisch, (515) 295-9352

IOWA

Wild Bill's Raceway, 901 W. Jones, Knoxville, IA 50138; William Anderson Jr., (515) 842-5973

IOWA

KANSAS

Creeks Crossing Speedway, 2340 Military Rd., Baxter Springs, KS; Richard, (316) 856-5086

KANSAS

Ebersole Hobby and Raceway, 11417 W. Hwy. 54, Wichita, KS 67209; Sherri McWilliams, (785) 722-8888

KANSAS

Hobbytown USA, 2016 W. 23rd, Lawrence, KS 66046; Kevin Decembris, (785) 865-0883

KANSAS

Mike's R/C Hobbies, 121 SE 29th St., Unit #3, Topeka, KS 66605; Mike Barnard, (913) 266-5767

KANSAS

Ottawa Outlaw Raceway, 114 South Main, Ottawa, KS 66067; Tom Wilson, (913) 242-1450

KANSAS

R/C Superdome and T.Q. Pro Shop, 14 E. Avenue A, Hutchinson, KS 67501; Cody or Joe, (316) 665-6633

KANSAS

R.C.R.C. Raceway of Salina, 1300 E. Crawford, Bill Burke Park, Salina, KS 67401; Calvin, (913) 823-9588

KANSAS

T.Q. Pro Shop, 14 E. Ave. A, Hutchinson, KS 67501; Cody Jandrakovic, (316) 665-6633

KANSAS

KENTUCKY

Dixon's R/C Raceway, 1428 Lost Creek Rd., Hazard, KY 41701; Jeff Dixon, (606) 436-4820

KENTUCKY

Pit Stop Hobbies, 106 A St., Benton, KY 42025; Robert Fitzgerald, (270) 443-0052

KENTUCKY

Somerset Raceway, 188 Sycamore Dr., Bronston, KY 42518; Denny, (606) 561-4522

KENTUCKY

Trio Hobbies & R/C, 216 Redmar Plaza, Radcliff, KY 40160; Maurice Johnson, (502) 351-7547

Great Lakes R/C Racer's Club, 632 Plymouth Ave. NE, Grand Rapids, MI 49505; (616) 948-9798 or (616) 948-9814;

email: Gr8LksRacers@aol.com, www.members@aol.com/grtlscrcw/index.html

Hobby Hub

5859 M99, Diamondale, MI 48821; Verne Goebble, (517) 337-9278 or (517) 351-5843

Jon's Hobby, 4739 E. Pickard, Mt. Pleasant, MI 48858; Jon Beutler, (517) 773-5412

JT Superspeedway

W. Golden Ave., Battle Creek, MI 49015; Jerry or Sam, (616) 965-0116

Larry's Performance R/Cs, 43665 Utica Rd., Sterling Heights, MI 48314; Larry, (810) 997-4840

Lazer RC Speedway

2858 N. Wilmoth Hwy., Adrian, MI 49221; Russ Johnson, (517) 263-2806

Motor City Speedway, 1602523, mile Rd., Macomb Township, MI 48042; Gary Cornwell, (810) 677-2470

N.M.R.C.C. Raceway, Hobby Toy, Main St., Gaylord, MI 49735; Ed Schneider, (517) 732-3963

Ovatt's R/C Speedshop, 3920 N. U.S. 31 S., Traverse City, MI 49684; Jim Ovatt, (616) 947-6670

R.A.C.E. Inc.

3227 Mathews, Jackson, MI 49203; Sam Sprang, (517) 787-9161

Raw Roots Race Tracks, 14623 East Crosswell, 1/4 mile north on 152nd (off U.S. 31), West Olive, MI 49460; Roy Bennink, (616) 399-9338

R&L Hobbies & Racing, 9782 Portage Rd., Portage, MI 49002; Rex Simpson, (616) 323-3686; fax (616) 329-1744; email: rinfo@rlhobbies.com; www.rlhobbies.com

Robb's Hobbies, 1106 Columbus, Bay City, MI 48708; Dan, (517) 893-2712

Rodgers R/C Raceway, 7463 Ridge Rd., Britton, MI 49229; George Rodgers, (517) 451-8301

Superior R/C Raceway, 160 S. County Road 553, Lot 173, Gwinn, MI 49841; Frank Felster, (906) 346-7225

Thumb Raceway, 3441 Main St., Marlette, MI 48453; Jim Wilson, (517) 635-7848

Vicksburg Off-Road R/C Raceway, 50201 Silver St., Vicksburg, MI 49097; Tim, (616) 323-7963

T.J.'s RC Raceway, Rt. 2, Box 22C, Luther, MI 49656; Tod Smant, (616) 797-8035

Village Hobbies-n-Crafts, 195 N. Elm, Hesperia, MI 49421; Alan or Fran, (616) 854-1374

Village R/C Raceway, Prairie Ronde St., DeCatur, MI 49045; Chuck Nolke, (616) 423-7878

Washtenaw R/C Raceway, Ypsilanti, MI 48198; Jim Rousseau, (734) 395-5048

Willis Outdoor R/C Racetrack, 13922 Oakville-Waltz Rd., Willis, MI 48191; Mike Higgins, (734) 587-2012

MINNESOTA

Bemidji R/C, 1015 Miles Ave. S.E., Bemidji, MN 56601; Russ or Ryan, (218) 751-1629

Car Town USA, 2822 Piedmont Ave., Duluth, MN 55811; Roger Deloach, (218) 727-6248

Central RC

1620 Central Ave., Minneapolis, MN 55330; Doug Ringold, (612) 781-1640

Country R/C Raceway Park

24214 325th St., Belview, MN 56214-8115; Charles L. Steffl, (507) 641-8115

Duey's Hobbies & R/C Raceway, 6600 Cahill Ave., Inver Grove Heights, MN 55076; Duey Carlson, (612) 450-1721

Granite City R/C Speedway, 3555 Shadowwood Dr. N.E., East Hwy. 23, Sauk Rapids, MN 56379; Brett Donahue, (320) 251-6980

J's Radio Control Race Park, 22994 290th Ave., Starbuck, MN 56381; Jay Campbell, (320) 239-4827

Kevin's Private Off-Road Raceway, 702 So. Washington Ave., Crookston, MN 56716-2317; Kevin Altpeper, (218) 281-7523 or (218) 281-7491; www.rv.net/krc; email: kevn@rv.net; (note: registration required for permission of use)

Northwoods Hobby Raceway, 2638 Hwy. 25 North, Brainerd, MN 56401; Tom Grogg, (218) 829-9257

Ray's Raceway Park, 105 3rd Ave. NE, Glenwood, MN 56334; Dan Winter, (320) 634-5246

R/C Racing World, 235 Main Ave. North, Harmony, MN 55939; Mark McKay, (507) 886-5931 or (507) 886-2224

Red Barn RC Raceway, Rt. 4, Box 333, Mankato, MN 56001; Rusty Weiss, (507) 345-8972

Southside Speedway, 2241 Marion Rd. SE, Rochester, MN 55904; Kevin Guy, (507) 281-3233

Sport Zone RC Race Park, 32339 Harris Town Rd., Grand Rapids, MN 55744; Greg, (218) 326-8956

Time R/C Raceway, 20 West Lake St., Chisholm, MN 55719; RV, (218) 254-4321

Small Cars Unlimited, 820 Cooper Rd., Jackson, MS 39212; (601) 372-FAST; www.smallcarsunlimited.com

X-Treme RC, 18332 Amanda Ln., Saucier, MS 39574; Marty Capers, (228) 539-2004

All Seasons Hobby, 29 O'Fallon Square, O'Fallon, MO 63366; Bob Daniels, (314) 281-8767

B&L Hobbies & Raceway, 2800 Anchor Dr., Park Hills, MO 63061; Bob Marler, (573) 431-9444

Fire Mountain Raceway, 8647 Commercial Blvd., Pevely, MO 63070; Dan Gordon, (314) 475-6449

Greentree R/C Racepark, St. Louis Dirt Burners R/C Club, Marshall Rd., Kirkwood, MO; (314) 831-2194

Hobbies 'N Stuff Raceway, 204 Mail Pkwy., Wentzville, MO 63385; Tim Satchwell or Crandall Olds, (314) 327-6006

Illinois R/C Raceway, 111 S. Applegate Rd., Itasca, IL 14850; Jerry and Lori Achilles, (607) 277-0940

LI 1/4-Scale Racers, 63 Horton Dr., Huntington Station, NY 11746; (516) 351-5384

Long Island Raceway, 168 Broad Hollow, Farmingdale, NY 11735; James, (516) 845-7223; www.raceway.com

MTW Raceway, 11930 Johnny Cake Hill Rd., Cato, NY 13033; Wade, (888) 39-HOBBY

Performance Plus Radio Control Speedway/The Hobby House, 1141 1/2 Jones & Gifford Ave., Jamestown, NY 14701; (716) 488-1772

P.R.O. Speedway, 5 Washington St., Cattaraugus, NY 14719; Marc Pritchard, (716) 257-3101

Radio Hill Raceway, 1219 Shannon Corners Rd., Dundee, NY 14837; Bill Brewer, (607) 243-8641 or Greg Areford, (607) 243-7899

Rampage R/C & Hobbies, 782 Rt. 96, Rockledge Plaza, Hyde Park, NY 12538; Brian Walker or Kevin Bobb, (914) 229-1379

R/C Competition Corner, 2202 Brewerton Rd., Mattydale, NY 13211; Lori and Cos Ciriello, (315) 455-8718

North Missouri Raceway, 223 Graves St., Chillicothe, MO 64601; Billy Johnston, (660) 646-1120

Novelty R/C Raceway, Rt. 1, Box 132A, Novelty, MO 63460; Rex or Jena, (660) 739-4546; email: rexjen@marktwain.net

Ozark Mountain Speedway, Rt. #2, Box 50, H-Highway and County Rd. 31, Noel, MO 64854; Clayton Younker, (417) 475-6222

Ozarks R/C Raceway, Hwy 13N, Brighton, MO 65781; Gene Rhodes or Ron Hawkins, (417) 742-4376 or (417) 742-7223

Real Blue Vue Speedway, 12019 E. 47th St., Kansas City, MO 64133; Steve Hale, (816) 358-0238; www.geocities.com/real_rc_raceway

Real R/C Raceway, 24204 State Rt. 58, Pleasant Hill, MO 64080; Steve Hale, (816) 540-5584

Stormer Raceway & Slot Motorplex, P.O. Box 126, Hwy. 2 East, Glasgow, MT 59230; (406) 228-4569

St. Louis R/C Raceway, 111 S. Applegate Rd., Itasca, IL 14850; Jerry and Lori Achilles, (607) 277-0940

Jefferson Speedway, 5494 Berkshire Valley Rd., Oak Ridge, NJ 07438; (201) 697-7525

Jerry's Hobby Center & Raceway, 336 Rt. 22W, Greenbrook, NJ 08812; Jerry or Gary, (908) 752-6030

LBRA Track, 392 Warburton Pl., Long Branch, NJ 07740; (908) 222-5122

Millville R/C Oval, 114 N. High St., Millville, NJ 08332; William Denstoz, (609) 327-4640

On Trax Hobbies, 3101 Rte. 70, Browns Mills, NJ 08015; Joseph DiGirolamo, (609) 735-0422

South Jersey Cost Controlled Racing, 25 Jackson Ln., Sicklerville, NJ 08081; Ray Murray, (609) 629-4809

The Race Place, 1151 Hwy. 33, Farmingdale, NJ 07731; John Fary, (908) 938-5215

Las Cruces R/C Racer's Association, Meerscheid Recreation Center, Walnut and Hadley by BMX, Las Cruces, NM 88001; D.J. Clark, (505) 546-4269; email, jade@zianet.com; www.zianet.com/jade/ccrra.htm;

Lizard Raceway, P.O. Box 1248, Verdi, NV 89439; Jeff Griffin, (702) 345-6573

Bill's Hobby Shop, 1000 N. Nellis Blvd., Las Vegas, NV 89110; Bill Schultz, (702) 531-3282; website: www.billshobbyshop.com

Dansey's Indoor R/C & Hobbies, 741 N. Nellis, Las Vegas, NV; David Lugo, (702) 453-RACE, (888) 675-8963; www.danseys.com

Wacha's R.C. Speedway, 1823 23rd St., Columbus, NE 68601; Tom Smith, (402) 564-9216

The Speed Zone, 1524 Atokad Dr., South Sioux City, NE 68776; Rob Murdock, (712) 428-4679, or Jim Carson, (712) 274-7731

Wacha's R.C. Speedway, 1823 23rd St., Columbus, NE 68601; Tom Smith, (402) 564-9216

Salvation Army South Corps, 4032 Harrison St., Omaha, NE 68164; (402) 734-3414; fax (402) 734-3415

T & T Raceway, 476 26th Ave., Columbus, NE 68601; Tom, (402) 564-9216

RC Motorsport Off-Road Raceway, 5600 Mass Rd., Papillion (Omaha), NE 68133; Marty Stepanek, (402) 593-6133

OTWG Carpet Raceway, 55129 849th Rd., Norfolk, NE 68701; John Schoenauer, (402) 644-7922

RC Motorsport Off-Road Raceway, 5600 Mass Rd., Papillion (Omaha), NE 68133; Marty Stepanek, (402) 593-6133

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RC Motorsport Off-Road Raceway, 5600 Mass Rd., Papillion (Omaha), NE 68133; Marty Stepanek, (402) 593-6133

NEW HAMPSHIRE

Axis Racing R/C Dragway, 4197 High St., Exeter, NH 03833;v Dan Peterson, (603) 659-4877

Economy R/C Speedway, 4 Maple St., Winchester, NH 03470; Harold Thomas, (603) 239-4482 or 239-6470

North Haverhill R/C Racing, Main St., N. Haverhill, NH 03774, Shelly White, 111 Golf Links Rd., Wells River, VT 05081; Todd White, (802) 757-2579

Robert's Railroad & Hobbies, 1335 1st NH Turnpike—Rt.4, Northwood, NH 03261; Robert M. Jeffers Jr., (603) 942-5193

RT 106 Racepark, 743 Clough Mill Rd., Pembroke, NH 03275; Fred Farwell, (603) 224-RACE

American Raceway, 142 Wilson Ave., Englishtown, NJ 07726; Doug Venner, (732) 446-3737; email: DMC12@prodigy.net

America's Hobby Center Inc., 8300 Tonnelle Ave., North Bergen, NJ 07047; John Many, (201) 662-0777

Checkerboard Raceways, P.O. Box 240, Elwood, NJ 08217; Ray Murray, (609) 629-4809

Family Hobbies Raceway, 3576 N.W. Blvd. & Weymouth Rd., Vineland, NJ 08360; Linda Vogel, (609) 696-5790

Jackson R/C Racing, P.O. Box 565, Christopher Columbus Blvd., Jackson, NJ 08527; Al Sodano, (732) 364-6422, or Ed, (732) 928-8963

Jefferson Speedway, 5494 Berkshire Valley Rd., Oak Ridge, NJ 07438; (201) 697-7525

Jerry's Hobby Center & Raceway, 336 Rt. 22W, Greenbrook, NJ 08812; Jerry or Gary, (908) 752-6030

LBRA Track, 392 Warburton Pl., Long Branch, NJ 07740; (908) 222-5122

Millville R/C Oval, 114 N. High St., Millville, NJ 08332; William Denstoz, (609) 327-4640

On Trax Hobbies, 3101 Rte. 70, Browns Mills, NJ 08015; Joseph DiGirolamo, (609) 735-0422

South Jersey Cost Controlled Racing, 25 Jackson Ln., Sicklerville, NJ 08081; Ray Murray, (609) 629-4809

The Race Place, 1151 Hwy. 33, Farmingdale, NJ 07731; John Fary, (908) 938-5215

Las Cruces R/C Racer's Association, Meerscheid Recreation Center, Walnut and Hadley by BMX, Las Cruces, NM 88001; D.J. Clark, (505) 546-4269; email, jade@zianet.com; www.zianet.com/jade/ccrra.htm;

Lizard Raceway, P.O. Box 1248, Verdi, NV 89439; Jeff Griffin, (702) 345-6573

Bill's Hobby Shop, 1000 N. Nellis Blvd., Las Vegas, NV 89110; Bill Schultz, (702) 531-3282; website: www.billshobbyshop.com

Dansey's Indoor R/C & Hobbies, 741 N. Nellis, Las Vegas, NV; David Lugo, (702) 453-RACE, (888) 675-8963; www.danseys.com

Wacha's R.C. Speedway, 1823 23rd St., Columbus, NE 68601; Tom Smith, (402) 564-9216

The Speed Zone, 1524 Atokad Dr., South Sioux City, NE 68776; Rob Murdock, (712) 428-4679, or Jim Carson, (712) 274-7731

Wacha's R.C. Speedway, 1823 23rd St., Columbus, NE 68601; Tom Smith, (402) 564-9216

Salvation Army South Corps, 4032 Harrison St., Omaha, NE 68164; (402) 734-3414; fax (402) 734-3415

T & T Raceway, 476 26th Ave., Columbus, NE 68601; Tom, (402) 564-9216

RC Motorsport Off-Road Raceway, 5600 Mass Rd., Papillion (Omaha), NE 68133; Marty Stepanek, (402) 593-6133

OTWG Carpet Raceway, 55129 849th Rd., Norfolk, NE 68701; John Schoenauer, (402) 644-7922

RC Motorsport Off-Road Raceway, 5600 Mass Rd., Papillion (Omaha), NE 68133; Marty Stepanek, (402) 593-6133

NEW MEXICO

Big Boys Toys Raceway, 1735 Juan Tabo, Albuquerque, NM 87112; Isaac Garcia, (505) 298-1023; www.bigboytoys.theshoppe.com

Charlie's Hobby Shop, 225 E. Idaho, Ste. 11, Las Cruces, NM 88005; Kim, (505) 541-1097

Las Cruces R/C Racer's Association, Meerscheid Recreation Center, Walnut and Hadley by BMX, Las Cruces, NM 88001; D.J. Clark, (505) 546-4269; email, jade@zianet.com; www.zianet.com/jade/ccrra.htm;

Lizard Raceway, P.O. Box 1248, Verdi, NV 89439; Jeff Griffin, (702) 345-6573

Bill's Hobby Shop, 1000 N. Nellis Blvd., Las Vegas, NV 89110; Bill Schultz, (702) 531-3282; website: www.billshobbyshop.com

Dansey's Indoor R/C & Hobbies, 741 N. Nellis, Las Vegas, NV; David Lugo, (702) 453-RACE, (888) 675-8963; www.danseys.com

Wacha's R.C. Speedway, 1823 23rd St., Columbus, NE 68601; Tom Smith, (402) 564-9216

The Speed Zone, 1524 Atokad Dr., South Sioux City, NE 68776; Rob Murdock, (712) 428-4679, or Jim Carson, (712) 274-7731

NEW YORK

B&S RC Speedway, 15661 Route 31, Albion, NY 14411; Dan Bellor, (716) 589-0621; bandsspeedway@go.to; www.go.to/bandsspeedway

Axis Racing R/C Dragway, 4197 High St., Exeter, NH 03833;v Dan Peterson, (603) 659-4877

Economy R/C Speedway, 4 Maple St., Winchester, NH 03470; Harold Thomas, (603) 239-4482 or 239-6470

BarnStormers Speedway, 205 Gray Court Rd., Chester, NY 10918; Lou, (914) 469-6468; trackside (914) 469-8206

Brennan's R/C Hobbies, 6368 State Rt. 5, Vernon, NY; Bill or Tom Brennan (315) 829-4930

Brownie's Pro & Sport Hobbies, 124 Bennett St., Staten Island, NY 10302-1426; John Brown, (718) 727-2194

Bruckner Racing, 2908 Bruckner Blvd., Bronx, NY 10465; Thomas Baffers Sr., (800) 288-8185

BSK Hobbies & Raceway, 120 Main St., Hornel, NY 14843; Bruce Harris, (607) 324-4011, (800) 603-0197

C&D Raceway, 12542 NYS Rte. 12E, Chaumont, NY 13622; Chris or Don Bourquin, (315) 649-5403

Capital District R/C Racers, 27 Venus Dr., Albany, NY 12211; Peter Willis, (518) 482-7128

Chipmunk Hill R/C Speedway, 217 Pine St., Theresa, NY 13691; Ted or Pete House, (315) 628-5065

Competition Hobby Speedway, 1006 Loudon Rd. Rte. 9, Latham, NY 12047; Howie or John, (518) 786-3622

Silver State R/C Club, Centennial Park, Carson City, NV 89501; (702) 853-3953



Southern Tier Raceway, 88 Paige St., Owego, NY 13827; Anita Harding, (607) 687-5395



South Shore Hobby & Raceway, 464 East Main St., Patchogue, NY 11772; Benny or Bonnie, (516) 758-5567



Tri County Remote Control Car Club, 33 West Decker St., Johnstown, NY 12095; Tom Leville, (518) 725-1279



TARMAC—Ultimate R/C Raceways, 28/30 Mountain View Rd., Poughkeepsie, NY 12603; Todd, (914) 342-5409; Greg, (914) 528-5084; trackside, (914) 454-8276; www.tarmacraceway.com



Walt's Hobby, 2 Dwight Park Dr., Syracuse, NY 13209; (315) 453-2291



Westfield R.C. Speedway, 27 Clark St., Westfield, NY 14787; John or Jared Lindstrom, (716) 326-2339; 716-326-2309



Whitestone, 30-56 Whitestone Expy. (Dept. of Motor Vehicles), Flushing, NY 11374; Rudolf Ardilla, (718) 966-6155



Willis Hobbies R/C Speedway, 300 Willis Ave., Mineola, NY 11501; Ken Ford, (516) 746-3944



ZOAR Road Speedway, 15318 Armes Ct., Gowanda, NY 14070; David & Gordon Ackler, (716) 532-9463



NORTH CAROLINA

A&J R/C Models, 2051 Anthony Rd., Burlington, NC 27215; Jerry Loye or Andrea Thompson, (336) 227-4556; fax (910) 227-1001



The Antique Barn, 2810 Forest Hills Rd., Wilson, NC 27893; (252) 237-6778



Atlantic Coast R.C., 8-A Lockhead Ct., Greensboro, NC 27409; Charlie Higgins or Harry Johnson, (336) 664-1277



Badin Shore Raceway, 1730 Jackson Lake Rd., High Point, NC 27263; Jimmy or Tim Martin, fax (910) 431-6407



C/C Hobby Speedway, 8358 U.S. Hwy. 220 Bus. N., Randleman, NC 27317; Steve & Mary Cox, (910) 495-3482



C/W R/C Speedway, 1297 Charlotte Hwy., Asheville, NC 28730; Billy or Tim, (828) 684-0061



Carolina Dragway, 1555 Turkey Hwy., Clinton, NC 28328; (910) 592-9489



Chatham R/C Raceway, 326 Reno Sharpe Store Rd., Bear Creek, NC 27207; Dwight Fields, (919) 898-2991



Green Flag RC Raceway, 107 Harley Rd., Wilmington, NC 28401; Mike McLemore, (910) 452-1620



R & D Speedway, 418 Main St., Tarboro, NC 27886; John Dupree, (919) 823-2294



Ride & Slide R/C Raceway, 5319 Yarkin Rd., Fayetteville, NC 28303, Bill Culbertson, (910) 867-4202



Radio Jockey's Parkway, "R.J.," Rt. 9, Box 651, Fay, NC 28301; www.wave-net.net/mshutt; Tony Starling, (910) 486-4820



R.C.R. Speedway, 1415 Henderson Grove Church Rd., Salisbury, NC 28147; Ronnie Linker, (704) 637-2565



Rosewood R/C Speedway, 651 Community Dr., Goldsboro, NC 27530; Glenn Elam, (919) 734-7754



Southern RC Motorsports Club, Hwy. 17S., P.O. Box 1651, Shallotte, NC 28459; Mark Whitt, (910) 754-4902 or Eddie Ferster, (910) 754-8528



Youngsville R/C Club, 6516 NC 96 Hwy., Youngsville, NC 27596; James Ray, (919) 556-0446



NORTH DAKOTA

Northern Mini Racers, 1000 36th St. S.E., Minot, ND 58702; Mike, (701) 838-5818



River City R/C, 2714 Main Ave., Fargo, ND 58103; Chris, (701) 235-1272



OHIO

AK Hobby and Raceway, 3826 North Bend, Cincinnati, OH 45211; Tim Tolle, (513) 661-7080



American Ohio Sprint Car, 1708 Empire Rd., Wickliffe, OH 44092; Gary Waldheim, (440) 944-9966



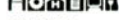
Classic Hobbies, 1994 E. Waterloo Rd., Akron, OH 44312; Walt Ellis, (330) 733-6400



CORCAR/Sams Club, 128 Amity Rd., Galloway, OH 43119-8732; Bill Stevenson, (614) 870-7159



Columbus R/C Racing Club (C.R.C.R.C.), Franklin County Fairgrounds, Hilliard, OH 43026; Jeff Crowell, (614) 236-1783



D&J R/C Raceway, 801 W. Market St., Orrville, OH 44667; Don Yoder or Mark Nussbaum, (330) 682-4266



DeFosse Raceway, 7652 Gooselick Rd., Ripley, OH; Greg DeFosse, (937) 377-2063



Full Throttle Raceway, 600 Mt. Moriah Dr., Cincinnati, OH 45255; Bill Dolch, (513) 943-9009 or via pager at (513) 730-1073



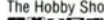
Glass City Radio Control, 2620 Ivy Pl., Toledo, OH 43613; Frank Johnson, (419) 472-1286



Greentown R/C Raceway, 3353 Perrydale, Greentown, OH 44630; Chuck Lambert, (330) 364-6585



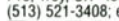
Hobby Shop Raceway, 2096 Miamisburg Centerville Rd., Centerville, OH 45459; The Hobby Shop, (937) 436-6161



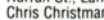
Hobby World, 3499 SR 59 Ravenna, OH 44266; Tom Fry, fax (330) 296-0894



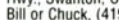
J & L R/C Raceway, 5342 W. St. Rt. 718, Troy, OH 45373; Mike Wegman, (513) 521-3408; email: wegs@one.net



Lafferty R/C Raceway, Box 153, 70228 Hurrah St., Lafferty, OH 43951; Chris Christman, (740) 968-4818



Mid American Raceway, 13150 Airport Hwy., Swanton, OH 43558; Bill or Chuck, (419) 475-9459



Nothing But Air R.C. Track, 34632 True Rd., Logan, OH 43138; Gary Lloyd, (740) 385-0288



R&R Speedway, 1258 W. Alexis, Toledo, OH Ron Tennyson, (734) 665-2649;



TARCAR, 7216 Nebraska Ave., Toledo, OH 43617; Bill Bridges, (419) 826-3859



Van Wert R/C Raceway, 144 E. Main St. (above Hoverman Music), Van Wert, OH 45891; Mark Davis, (419) 232-2112



Y-City Hobby & Speedway, 120 S. 6th St., Zanesville, OH 43701; Kevin McKenna, (674) 455-3025



OKLAHOMA

Adams Creek R/C Speedway, 5207 S. 194th E. Ave., Broken Arrow, OK 74014; John Beighle, (918) 355-1416



Competition R/C, 100 S.E. 89th, Oklahoma City, OK 73149; James or Louise Brown, (405) 634-0809



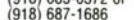
Enid R/C Speedway, 1821 S. Van Buren (Hwy 81), Enid, OK 73701; Bob, (580) 233-3344 or (580) 234-7666



R/C Speedway of Lawton, 202 Southeast B Ave., Lawton, OK 73501; Rick, (580) 355-8040



Wild Country Speedway, 127 S. Main, Porter, OK 74454; Charles McCollough, (918) 685-0372 or (918) 687-1686

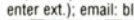


OREGON

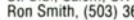
Competition Racing Association, 17941 N.E. Gleason, Portland, OR 97230; Mark Taylor, (503) 761-1334



D.I.R.T. R.O.A.D. Club, 65540 73rd St., Bend, OR 97701; Daley and Edward Giletz, (541) 388-2932 or (800) 475-6040, ext. 777 (at 2nd dial tone, enter ext.); email: blue@coinet.com



R/C Plus Hobbies Raceway, 1857 25th St. S.E., Salem, OR 97302; Ron Smith, (503) 364-9188



R/C Speed Center, 2810 N. Pacific Hwy., Medford, OR 97501; Gene and Betty Jean Skelton, (541) 779-8298



Rose City Scale Racing, Highway 224, K-Mart parking lot, Milwaukie, OR 97222; Rick Strauss, (503) 631-2929



Yamhill County R/C Car Club, 722 Morgan Ln., McMinnville, OR 97128; Larry Rucker, (503) 472-7234



PENNSYLVANIA

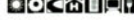
B&B Raceway, 1301 Pine St., Berwick, PA 18603; Ray Berry Jr., (717) 599-3469



Courtview Raceway, 20 S. Main Street (lower level), Washington, PA 15301; Aaron Stimmel Jr., (724) 225-4302



DC Ultra Trax, 13 York Rd., Wycombe, PA 18974; David Cowan, (215) 672-5200



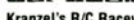
D&D Hobby Shop, 305 3rd St., Rouseville, PA 16344; (814) 676-4475



Dreamboat Hobbies, 2810 Pennsylvania Ave. W., Warren, PA 16365; Louie Dussia, (814) 723-8052



Koontz's Home & Hobby Center, 1205 Hoover St., Pittsburgh, PA 15204; (412) 331-3866



Kranzel's R/C Raceway & Hobbies, 415-B Bosler Ave., Lemoyne, PA 17043; David or Stuart Kranzel, (717) 737-7223



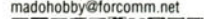
Little Plum R/C Hobbies, RR 1, Box 330, Lock Haven, PA 17745; Larry Duck, (570) 769-1984



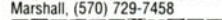
Lugnut Raceway, 1713 Bethlehem Pike, Hatfield, PA 19440; Bill Henning or Kathy Anderson, (215) 822-5831



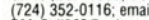
Mad-O Hobby Raceway, 850 Freedom Crider Rd., Freedom, PA 15042; Don Goodrich, (724) 774-0240; madohobby@forcomm.net



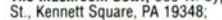
Marshall's R/C Raceway, RR 4, Box 640, Honesdale, PA 18431; Bill or Dot Marshall, (570) 729-7458



McCullough's Offroad, 108 Callen Rd., Sarver, PA 16055; Doug McCullough, (724) 352-0116; email: DMcCull323@aol.com



The Mushroom Bowl, 960 W. Cypress St., Kennett Square, PA 19348; Bruce or Drew, (610) 444-1850



Pinion Twisters, 3M Plant, Green Ln. and Mitchell, Bristol, PA 19007; Mark, (215) 632-2344 or Tony, (215) 742-3560



Pit Stop Hobbies, 262 W. Main St., Mount Joy, PA 17552; James Stoudt Jr., (717) 653-6222



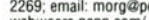
Prop & Wheels Raceway, 139 W. Broad St., Tamaqua, PA 18252; Gil Walters, Prop & Wheels Hobbies, (570) 668-2288



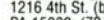
Racers Edge R/C Racing, RR#1, Box 271, Smethport, PA 16749; Rick Morgan or Johna Simar, (814) 887-2269; email: morgan@penn.com; web.users.penn.com/~morg/track.html



The Raceway at River Junction, 1216 4th St. (behind cemetery), Beaver, PA 15009; (724) 728-5571



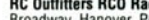
RC Ave. Raceway, 324 McKinley Ave., Latrobe, PA 15650; Scott Smith, (412) 537-5501



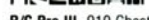
RC Outfitters RCO Raceway, 519 Broadway, Hanover, PA 17331; Chris Shaffer, (717) 633-9490; http://rco.webjump.com



R/C Pro III, 910 Chestnut St., Coal Twp. (Shamokin), Shamokin, PA 17866; John Swisher, (570) 648-7763



Riverside Raceway, Penna. Ave. W. & Hickory, Warren, PA 16365; Jeff, (814) 723-4211



S.A. Hi Banks, Hahn's Dairy Rd., Palmerton, PA 18071; Scott Andrews, (610) 826-4583



Somerset Hobby Shop Outlet, 4309 Rhodes Pike, Somerset, PA 15501; Bob Rhodes, (814) 445-6214



Staub Bros. R/C Speedway, 31 Locust St., Gettysburg, PA 17325; Todd or Scott Staub, (717) 334-5445



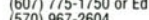
TnT Raceway, Randolph Rd., Great Bend, PA 18821; Frenchie, (607) 775-1750 or Ed Kraft, (570) 967-2604



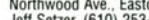
Trains & Lanes Raceway, 3825 Northwood Ave., Easton, PA 18045; Jeff Setzer, (610) 253-8850, (800) 447-4891



Willow Mill Speedway, 37 N. Season's Dr., Dillsburg, PA 17019; George Verbowitz, (717) 432-4445

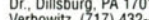


World A.T.L.A.S./P.A.R.C.E. R/C Raceway Hobby Shop & R/C Club, Chester Exchange Mall, 10th & Morten St., Chester, PA 19013; Darryl, Lee or Marc, (610) 874-2540



PUERTO RICO

Area 51 On Road Track, Carr 931 KM 1.5, Bonavaro, Gurabo, PR 00745; (787) 739-1572



Cidra R/C Track, Carr 7787 KM 1.6, Bo Beatriz Aentro, Cidra, PR 00739; Humberto (Tito) Lizardi, (787) 739-1572



Dorado Offroad R/C Track, Pista Atletica Bo. Higullar, Dorado, PR 00646; Roberto Lamosa/Jaime Ramos, (809) 796-5603 or (809) 796-1734



Hacienda Muñoz R/C Track, Carr. #14, Juana Diaz, PR 00995; (809) 837-7083



Hi-Speed C Raceways, 422 San Claudio Ave., San Juan, PR 00926; Carlos Ortiz, (787) 283-0198



Isabela R/C Track, 390 Sur Guaynabo, PR 00969; Fernando Salcedo or Alvaro Obregon, (

Tri-State R/C Club, Sioux Empire Fair Grounds, Sioux Falls, SD 57105; Chad Walth, (605) 357-9654; email: losman@email.msn.com

R/C Action Raceway

SE Corner at 48th & Hwy. 38, Sioux Falls, SD 57105; Brian Cox, (605) 373-0511

TENNESSEE

D&M's Downtown Raceway, 2703 U.S. Hwy. 411S, Maryville, TN 37303; (423) 681-8919

Futrell's R/C Hobby Shop

1715 Jackson Ave., Seymour, TN 37865; Dan Futrell, (423) 908-9526

Hobby Town USA

2000 Mallory Ln., Franklin, TN 37067; Bobby Mills, (615) 771-7441

Interstate Raceway

5237 Highway 126, Blountville, TN 37617; Dale or Mark, (423) 323-1513; mktstanz@intermediatn.net

MID-South Racing Association

9155 Hwy. 72 (Poplar Ave.), Germantown, TN 38138-7903; (901) 757-8774

MSA Racing

120 Villageaway, Crossville, TN 38555; D.R. Findley, (931) 456-0027

R & R Racing Portable Track

RR3, Box 34, Linden, TN 37096; Ross or Ron, (931) 589-5433

TnT Raceway

643 Loop Hollow Rd., New Tazewell, TN 37825; Cliff Swett, (423) 869-8942

W.O.W. Raceway

59 Luray Rd., Beech Bluff, TN 38313; Brad Jones, (901) 423-4784; email: womngri1@abac.com; http://go.to/wowracing

TEXAS

215 Speedway, 1814 County Rd. 215, Abilene, TX 79602; Clyde Gardner, (915) 673-2351

B&B R/C Hobbies

700 East 4th, Big Spring, TX 79720; Walter Bumbulis, (915) 263-1790

Big Mike's R/C Raceway

1405 W. Cotton St. (behind the Locker Room), Longview, TX 75604; (903) 297-7814

Comanche Trail RC Park

City Park, Big Spring, TX 79720; Allen Nichols, (915) 263-4241

Discount Hobbies

1722A West Anderson Loop, Austin, TX 78757; Tony Bermudez, (512) 458-2324

Drycreek Raceway

5903 Co. Rd. 2297, Quinlan, TX 75474; Micky Alphin, (903) 883-4060

Finish Line Raceway

2775 N. Hwy. 360, Ste. 637, Grand Prairie, TX 75050; Steve Manning, (817) 652-3340

Hal's Hobby Raceway

1440 Bessemer, El Paso, TX 79936; (915) 591-2213

Hobbytown USA

999 E. Basse Rd., Ste. 177, San Antonio, TX 78209; Joe Sena or Clark Baisdon, (210) 829-8697; fax (210) 829-8707

Hot Rod's Raceway

4218 Boston Ave., Lubbock, TX 79413; Rodney, (806) 797-9964

Issac's Race Track

18177 Gulf Frwy., Houston, TX 77598; Issac Ben-Ezra, (281) 488-8697

K & M Raceway Inc., 45000 Hwy. 59 N., New Caney, TX 77357; Brent Mahaffy, (281) 399-9777

MBRC Off-Road Raceway

204 D&E Valley Ln., Kennedale, TX 76060; Mike Battaille, (817) 563-1900

Mammoth R/C Racing

4221 Spencer, Pasadena, TX 77504; John, (713) 946-2522

Mike's Hobby Shop Superstore and Raceway

1605 Crescent Cir., Carrollton, TX 75006; (972) 242-4930; www.mikesobbyshop.com

Performance Raceway

1106C Witte Rd., Houston, TX 77055; Jorge or Terry, (713) 464-4458

Rev It Up Raceway Practice Track

3076 Keller Rd., Smithville, TX 78957; Rev, Alton T. Edwards, (512) 237-5903

Rick's R/C Raceway

238 Scenic Loop, Boerne, TX 78000; Rick, (210) 981-2245 or Rich, (210) 590-1805

The Rollcage

3819 Hwy 34 South, Greenville, TX 75402; rollcage2000@earthlink.net; www.therollcage.com

Star/CAR Raceway

5802 Patton St., Corpus Christi, TX 78415; Glen Stead, (512) 949-8525; Race Hotline, (512) 881-6105

T&M Raceway

4150 Beltline Rd., Addison, TX 75244; (972) 478-2399

T&T R/C Cars

3420 Ave. K., Suite 154, Plano, TX 75074; Joe Sullivan, (972) 633-2470

Texas Speedway

6703 Chimney Rock, Bellaire, TX 77401; (713) 661-7137; www.texaspeedwayRC.com

T.Q. Offroad Raceway

6236 Quail, El Paso, TX 79924; Elren Saenz, (915) 821-7522

Warehouse Radio Controlled Raceway

5119 Plains Blvd., Amarillo, TX 79101; Craig or Darren Waddell, (806) 356-9080

W.E.S. Hobby Race

980 S. Fourth St., Beaumont, TX 77701; Edmond Richards, (409) 839-4929

UTAH

Intermountain R/C Raceway, 8481 W. 2700 S., Magna, UT 84044; David Mott, (801) 250-8303

Hobby Haven Raceway

4135 West 575 North, Cedar City, UT 84720; (435) 865-1274

Payson R/C Raceway

955 S. Main, Payson, UT 84651; Gus Wood, (801) 224-3852 and Lasca Wood, (801) 222-8677

Vision Hobby

352 N. State St., Orem, UT 84057; Ken Rice, (801) 226-6226

WOR R/C Raceway

3170 Brinker Ave., Ogden, UT 84401; Brian Worton, (801) 393-2530

VERMONT

Barre Town R/C Club, 14 S. Main St., Wall St. Complex, Barre, VT 05641; Russ or Pete, (802) 888-2860 or (802) 476-9458

Bradford R/C Racing

Main St., Bradford, VT 05033; Seth Bean, (802) 222-9674

Empire Hobbies Off-Road Raceway, 272 North Main St., Saint Albans, VT 05478; Scott or Jen; (877) 4-HOBBIE; email: mpirhobe@Togethr.net;

Stoughton Pond Raceway

Stoughton Pond Rd., Perkinsville, VT 05151; Rick Adams, (802) 263-9321

VIRGINIA

Brad's Hobbies, 1105 Greenville Ave., Staunton, VA 24401; Brad, (540) 885-3642

Brown Brothers Hobbies

928, N. Main Street, Dumfries, VA 22026; Joe or Bob Brown, (703) 221-5746; www.bb.hobbies.com

Cooper's R/C Race Center

4000 Sago Rd. (969), Chatham, VA 24531; Norris Cooper, (804) 724-7342 or (804) 724-4182; website: http://coopersrc.virtu-alave.net

DRCW Raceway

Debbie's RC World, 2200 Commerce Pkwy., Virginia Beach, VA 23454; Les Modlin, (757) 340-6681

Gloucester Scale Hobbies

2352 George Washington Memorial Hwy., Hayes Plaza, Hayes, VA 23072; Rob Thein, (804) 642-3484

Hampton RC Speedway

1920 E. Pembroke Ave., Hampton, VA 23663; Steve Long or Mickey Kern, (757) 723-1884; website: www.fortunecity.com/olympia/norman/26/

K & W Hobby and Sports

5186 Nine Mile Rd., Richmond, VA 23223; Ross Martin, (804) 737-3904

KC's Radio Control & Repair

Rt. 4, Box 312, Trents Ferry Rd., Lynchburg, VA 24503; Curtis or Kim Wright, (804) 384-8596

Olde Towne Hobby Shoppe

9105 Center St., Manassas, VA 22110; Arnie Levine, (703) 369-1197

The Racer's Edge

1230 West Main St., Danville, VA 24541; Al Harville, (804) 792-6011; email: webmaster@theracer-edge.virtualave.net; http://theracer-edge.virtualave.net

Roadmasters/Rick's Hobbies

12201 Balls Ford Ave., Manassas, VA 22110; Rick, (703) 330-6833

Shamroc Raceway

106 Cheviot Pl., Stephens City, VA 22655; Scott Janow, (540) 869-3551; note: track is located in Winchester, VA

Thunder Road RC Racing

P.O. Box 1022, Troy, VA 22974-1022; James Palmer, (804) 589-8174

Thunder Road RC Speedway

18079 James Madison Hwy., Gordonsville, VA 22947; Robert Bingle, (804) 296-6549; rwb3y@virginia.edu; www.come.to/thunderroad

The Tiltyard

6994 Tiltyard Dr., Dayton, VA 22821; (540) 828-3476; www.tiltyard.com; tiltyard@rica.net

Trainlano R/C Racing

5661 Shoulders Hill Rd., Suffolk, VA 23435; Frank Stevens, (757) 488-5454

WASHINGTON

A-Main Raceway, 14011 N.E. 3rd Ct., Vancouver, WA 98685; Monty Coleman, (360) 571-8404

Bear Creek Raceway

6319 Maltby Rd., Woodinville, WA 98072; Nathan Brockway, (425) 398-0140

Burien Toyota R/C, 15025 1st Ave. South, Seattle, WA 98148; Ray Meek, (800) 654-6456

Cedarvale Raceway

1673 Cedarvale Rd., Mount Vernon, WA 98273; Joe Madonia, (360) 659-0072; email: getchell@halcyon.com

Fantasy World Raceway

7901 S. Hosmer, Tacoma, WA 98408; Dave Kleinman, (253) 473-6223; www.fanta-syworldhobbies.com

Four Seasons R/C Racing

2941 Sleater Kinney Rd. N.E., Olympia, WA 98506; Gary and Sharon Brown, (360) 491-2430

Hank Perry Raceway

1901 N. Sullivan Rd., Spokane, WA 99023; Thom Mullins, (509) 928-2009

Race City

125 E. Main St., Auburn, WA 98002; Craig Haslebach, (253) 939-2515; trackside (253) 939-2515

Redmond Hobbies Raceway

16290 Redmond Way, Redmond, WA 98052; Stan Ng, (426) 882-2759

Spokane Indoor Raceway

6422 E. 2nd Ave., Spokane, WA 99212; Dave Mapston, (509) 534-7432

Tacoma R/C Raceway

6305 6th Ave., Tacoma, WA 98406; Scott Brown, (253) 565-1935

Rain City R/C Raceway

3616 South Rd., Suite A-3, Mukilteo, WA 98275; Peter, Andrew or Debbie, (425) 438-2454; ibauser@gte.net; www.rainci-tyraceway.com

Ultimate R/C Raceway

907 Cole St. #3, Enumclaw, WA 98022; Dan Daugherty, (360) 802-2388

West Coast Hobby & Raceway

2239 Stevens Dr., Richland, WA 99352; Darren Shank, (509) 375-4995

Zep's Hobbies & Raceway

530 Interlake, Moses Lake, WA 98837; Steve Ralph, (509) 765-8191

WEST VIRGINIA

Burr-Fab Raceway, 90 Davis St., West Union, WV 26456; Mark Travis, (304) 873-2487

Fulton's R/C Raceway

2646 Chapline St., Wheeling, WV 26003; James Fulton, (304) 233-5355

Left Turn Hobbies

100 Saco Ln. (by Post Office), Glen White, WV 25849; Stretch, (304) 255-3930

Race Zone

Hopewell Rd., Rt. 8, Box 343A, Fairmont, WV 26554; Joe Clutter, (304) 368-1000

WISCONSIN

ABC R/C Inc. & Raceway, 244 W. Main St., Waukesha, WI 53186; Dick Mathiesen, (414) 542-1245; www.abchobby.com; email: help@abchobby.com

Best's Hobbies

2700 West College Ave., Appleton, WI 54914; Peggy, (920) 734-5244

Dirt Heaven Hobby and Raceway

6028 County Rd. K, New Franken, WI 54229; sales@dirtheaven.com; www.dirtheaven.com; Aaron, (920) 866-9096

Gary's Hobby Center

3701 Durand Ave., Racine, WI 53403; Bill Phalen, (414) 554-8884

Hobbytown USA - Revolution, Memorial Mall, 3347 Kohler Memorial Dr., #D2, Sheboygan, WI53081; Kenny, (920) 452-0801

MARCCA Raceways

526 S. Monroe St., Monticello WI 53570 (mailing address only); George Sellon, (608) 243-1778; www.marcca.com

Mid-West Tri-Clone

3745 Shuster, West Bend, WI 53095; Tom Holz, (414) 334-0429

Pro-Star Racing

726 Pine St., Green Bay, WI 54301; Chuck, (920) 494-1233 or Terry, (920) 469-5566

Revolution Raceway

Memorial Mall, 3347 Kohler Memorial Dr., #D2, Sheboygan, WI 53081; (920) 452-0801 or (800) 594-9420

R.J.S./R.C.

4920 Hwy 70W, Eagle River, WI 54521; Randy Stys, (715) 479-2541

S&N's Trackside Hobbies and Raceway

6045 N. Green Bay Ave., Milwaukee, WI 53209; Scott Ernst, (414) 351-1910

WYOMING

Collectable Creations Off-Road Oval Track, 1790 Dell Range Blvd., Cheyenne, WY 82009; Phil Severson, (307) 632-2156

Wind River R/C Racing Association

113 S. 3rd E., Riverton, WY 82501; Bob Belding, (307) 857-2068

Xtreme Hobbies Raceway

2724 Powder Basin, Gillette, WY 82718; Krieg Balls, (307) 682-6077

ARGENTINA

Circuit M.R. Models, Av. Av. Monroe 1402, (1428) Capital Federal, Camino del Buen Ayre y Pte. DeBenedetti, Buenos Aires, Maximiliano, 54-011-47801677

Club A. Velez Sarsfield

Av. J.B. Justo 9000, C.P. 1408, Buenos Aires; Jorge Herrero, 54-01-658-5851

AUSTRALIA

A.C.T. Model Car Racing Club, Off-road track—Wanniasa Raceway, Hyland Place, Wanniasa A.C.T.; indoor track—Epic Complex, Northbourne Ave., Canberra North A.C.T.; Gary Davey, 61-6-2871411

A.C.T. Remote Control Car Club

Jenke Circuit, Kambah, Australian Capital territory; Rob Jorgensen, 61-2-6231-9925; email: sxs@dynamite.com.au

Aubry R/C Car Club

Aubry Showgrounds, Aubry, NSW 2640; Ron Langman, 060-247-128

Iliawarra RCECC, Croome Sporting Complex, Albion Park Rail, NSW 2527; Mel or Andrew, 042-714-683



Lakeside R/C Racing Car Club, Hollywood Dr., Lansvale, NSW 2166; R. Bartolozzi, 62-2-907-9800



Melton Electric Circuit Car Association, Salfway Car Park, corner High St. and Coburns Rd., Melton, VIC 3337; Arthur Joslin, 61-3-9747-8805



Northern Districts Model Rally Club, Inc., Rear Stanford Centre, 16 Stanford Way, Malaga, Western Australia 6066; G. Thirlwell, 61 (9) 249 3855; fax 61 (9) 249 4778; email tony@ois.com.au



Penfield Park, DSTO Complex Salibury, Adelaide, South Australia 5108; Trevor Unsworth, 618 8289-5010



R.C. Speedway, 259 King St., Newcastle, NSW 2300; Andrew Dillon-Smith, 02-49265966



Templestowe Flat Track Racers, Templestowe Reserve, corner of Porter St. and Williamsons Rd., Templestowe, Melbourne, Victoria 31066; Renato Benci, 61 (3) 9553 4625



Wee Waa's Offroad RC, KYEEMA, Burren Junction, N.S.W. 2386; Shane, 61-02-6796-1339



Wodonga R/C Car Club, 11 Murphy St., Wodonga, VIC 3690; Ron Langman, 61-60-247-128



AUSTRIA

RMC-Wien, Austernstrasse 5, Vienna, A-1220; Herbert Holze/Martin Hrzak, +43-664-4730376

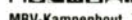


BELGIUM

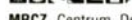
ATR-Alka-Tele-Racing, 3570 Stationstraat 21, Alken Limburg; 0032-11-25-49-03



Cartroubles Indoor Buggy Track, Jan Moonsstraat 52-56, 2160 Wommelgem; Guy Ermes, 32-3-326-51-15; fax 32-3-326-51-01



MBV-Kampenhout, Teniersin 28, Kampenhout B1910; Frank Mostrey, phone/fax 0-16-65-75-18



MRCZ, Centrum, De Burg, Montie, 75-71-63



Model Racing Club Oudenaarde, Scheldekant, 9700 Oudenaarde; A. Chantierie, 32-55-31-36-48; fax 32-55-30-19-12



R.C.R., Peilstraat 43, Retie 2470; A. Eelen, phone/fax 32-14-379685



BRAZIL

Amoc Cassacoçã de Modelismo B. Cambario, Junto ao Par Que Ecologico de Bal. Cambario, Bal. Cambario, S.C. 88.330-000; Leo Cesar, (047) 366-0001



Brasilia R/C Motor Circuit, Estacionamento do Estadio Mane Guarrinha, Brasilia, DF 70000; Alexandre (Alex), 55-061-273-7205



C.A.A.R. Curitiba Associacao de Automodelismo Radiocontrolado, Rua Theodoro Makioka, 2300 Santa Candida, Curitiba, PR 82650-530; Ronaldo Assumpcao, 55-41-354-2804



Electric Car Club R/C Santos, Av. Bernardino de Campos, 227, Santos, SP 11065-001; Estevam or Arnaldo, 55-013-232-2536



Hamilton Neto Associacia RC, Rua Uterer 259, Curitiba, Paran 80380-400; Danico Pilhax, 55-41-338-8041; hammer_usa@hotmail.com



Hobby Center, SQS 210 BLH Apt. 204, Brasilia, DF 70 273; 061-242-0488



Hobby Planet Racing Club, Rod Dom Pedro 1, KM 1315, Campinas, Sao Paulo 13091901; Daniel, Helio, Luciano, 019 258 2768



Jungle Drive, Rua Alberto Maranhao, No. 219 Icha do Gov. Rio de Janeiro, 21940-490; Paulo Brito, (021) 396-0851 or (021) 393-7449



MP Raceway, Av. Nacoes Unidas, 6815 Lapa, Sao Paulo; Gerd Heitrotter, 55-11-9819039; www.hpraceway.com.br



Off Roaders, Av. Guillerme Dummont Villars, 317, Sao Paulo, CEP 05640; Waldir Ielpo, (055) 011-260-5628; fax (055) 011-831-4931



Way of R/C Off-Road Cerrado, Rua Paraiba 1323, 1st floor, Belo Horizonte, Minas Gerais; Claudio T. Correa, (031) 227-6111, fax (031) 227-6869



CANADA

Action Weelz, 462 Turcotte, Vanier, Quebec, G1M 1R6; Regent Tardif, (418) 527-5756



Advance R/C Raceway, 4181 Sheppard Ave. E., Scarborough, Ontario M1S 1T3; Albert Lau, (446) 321-8377



The All New R.C. World, 2633 Hwy. #6, Mt. Hope, Hamilton, Ontario L0R 1W0; Dave, (905) 765-2301, Larry, (905) 333-3297 or Brian, (519) 752-0044



ATN, Auto Teleguidee Nicolet, 2000 Rue Paul Hubert, Saint-Jean-Baptiste-de-Nicolet, Quebec J3T 1E5; Louis Durand, (819) 293-6097



Auto Sprint, 6065 Des Grands Prairies, St. Leonard, Quebec H3G 2R6; David Kalayjian, (514) 287-3503



Blew Bye You Raceway, 134 Dike Rd., Chilliwack, British Columbia V2P 5B1; (604) 792-8978



Circuit J.C., 1283 Chemin, St. Philipe, St. Poly-carpe, Quebec J0P 1X0; Jean Castellon, (514) 265-3675



Circuit Pepsil, Centre de Location, 37 duRoi, Sorel, Quebec; (514) 746-8828



Circuit Plessis, 260 Rang 9 Ouest, Plessisville, Quebec G6L-2Y2; (819) 362-3743



Circuit R/C Pro, 1500 Chemin Sullivan, Val d'Or, Quebec; J9P 1M1; R/C Modeler Plus, (819) 874-3918



Circuit Teleguide St. Roch, 363-B St. Charles, St. Roch De L'Achigan, Quebec J0K 1H0; (514) 588-4254, fax (514) 588-6554



Circuit Teleguide Grand Prix II, 701, Sainte-Rose, Ste. 200, Laprairie, Quebec, J5R 1Z2; (450) 444-1286



Club Auto Teleguides, 1750 Mies Interprovincie, C.P. 35, Pointe-Fortune, Quebec, J0P1N0; Jacques St. Alevis, (514) 451-0078



Club Avatt, 244 Jules-Richard, Deauville, Quebec J1N 3; Daniel Vanier, (819) 864-6262



Club RC51, 44 Rue Holliday, Sept-Iles, Quebec G4R; Sylvio Gerard, (418) 968-6575; Hobby Shop, (418) 962-6565



CRCCC, Box 309, Clinton, Ontario NOM 1L0; Eric Russell, (519) 482-9429



CTG, 450 Chemin de la Grand Ligne, Granby, Quebec; (514) 358-4419



CTL, 495 Industriel, Longueuil, Quebec; (514) 358-4419



Dustkickers R/C Raceway, 1785 Cypress Rd., Quesnet, British Columbia V2J 4B1; Darrell Dinsdale, (250) 747-2680



Dynamic Hobbies, 21 Concourse Gate, Unit 6, Nepean, Ontario K2E7S4; Clark Freeman, (613) 225-9634



East Coast Model Center Raceway, 13 Glen Stewart Dr., Ste. 1, Southport, Prince Edward Island C1A 8X9; Gary Stephen, (902) 569-3262



Fast-Trax Speedway, RR 4, Trenton, Ontario; Russ McPeak, (613) 394-6411



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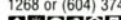
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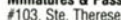
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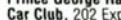
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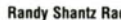
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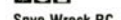
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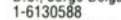


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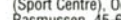
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RETURN TO:

Track Directory

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ADVERTISER INDEX

- AAA Model Supply/Dillon Racing, 197
ABC Hobbies, 204
Ace Hardware Hobbies, 206-207
Action Hobbies, 204
Airtronics, 86
America's Hobby Ctr., 198-199
Associated Electronics, 42-43, 87, 139, 157, 195
Atlantic Coast R/C, 204
B&B Software, 204
B&T Racing Team, 213
Boca Bearing Co., 204
Bolin R/C Cars, 214-215
Bruckner Hobbies, 150-155
California R/C Ctr., 140-141
CEN/Genka Trading Co., 60-61
Competition Electronics, 181
Custom R/C Design, 214
Deans, 156
Debbie's R/C World, 212
DuraTrax, 37, 39, 74-75, 149
eHobbies, 96-97, 210
ERI Associates, 212
Futaba Corp. of America, 94, 169, 197
G.T.P. California, 168
GS Racing, 58-59, 165, 211, 213
Hammad Ghuman, 56-57
Hitec/RCD, 35, 110, 167
Hobbythek, 179
Hobbytown USA, 66
Hobby People, 182-187
Hobby Products Int'l., 16-17, 68-69
Hobby Tech Inc., 112
Horizon Hobby Dist., 20-21, 25
Hudy Special Products, 123
Keyence Corp., 122
Killer Bee Racing, 181
Kondo Kagaku Co. Ltd., 48-49
Kyosho, 26-29, 84-85, 126, 162
Lite Machines, 179
LRP Electronics, 120, 139
Lunsford Racing, 213
M.D. Planes, 188-189
M.I.P., 113
Mach 1 Hobbies, 212
Megatech, 95
Model Rectifier Corp., 15
Mugen-Seiki Racing, 108
Multiplex USA, 170
Nagengast Hobbies, 160
New Era Models, 197
Niftech Precision Racing Products, 212
Novak Electronics, 23
O.S. Engines, 121
OFNA Racing, 18-19, 45, 47, 76-77, 124-125, 145, 177
Omni Models, 193
Outer Dimensions, 179
Parma Intl., 114
Peak Performance, 78
Perry's Hobbies, 179
Pro-Line USA, 6-7, 8-9, 216, 226-C3
Progressive Suspension, 214
R/C Car Kings, 174
R/C Neon, 92
Reedy, 157
Robinson Racing, 53, 54-55
RPM, 171
Savon Hobbies, 197
Serpent USA, 131
Sheldon's Hobbies, 190-191
Stormer Hobbies, 200-203
Tamiya America, C2, 40-41, 111, 205
Team Corally, 147
Team Losi, 67, 129, 161
Team Orion, 109
Tower Hobbies, 134-138, 175
Traxxas, 50-51
Trinity, 3, 4, 5, 10, 11, 12, 13, 30, 32-33, 93, C4
Yokomo USA, 79, 196

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830 W. Golden Grove Way, Covina, CA 91722; (626) 339-9007; fax (626) 966-2901; www.miponline.com.
- Mugen Seiki Racing Ltd.**
17971 Sky Park Cir., Ste. G, Irvine, CA 92614; (949) 475-9505; fax (949) 475-9511; www.mugenseiki.com.
- Niftech**
5565 Wilson Dr., Mentor, OH 44060; (440) 257-6018; fax (440) 257-4281; www.niftech.com.
- Novak Electronics Inc.**
18910 Teller Ave., Irvine, CA 92612; (949) 833-8873; fax (949) 833-1631; www.teamnovak.com.
- O'Donnell Racing**
10702 Hathaway Dr., #2, Santa Fe Springs, CA 90670; (562) 944-9671; fax (562) 944-8821.
- OFNA Racing**
22692 Granite Way, Ste. B, Laguna Hills, CA 92653; (949) 586-2910; fax (949) 586-8812; www.ofna.com.
- O.S. Engines**
distributed by Great Planes.
- Paragon Racing Products**
340 Industrial Blvd., Waconia, MN 55387-1738; (612) 442-6364; fax (612) 442-6368.
- Paris Racing**
4254 Independence St., Chino, CA 91710; (909) 465-1189; fax (909) 465-0089; www.parisracing.com.
- Parma/PSE**
13927 Progress Pky., North Royalton, OH 44133; (440) 237-8650; fax (440) 237-6333.
- Penguin R/C**
1230-P N Jefferson St., Anaheim, CA 92807; (714) 630-9015; fax (714) 630-6250.
- Pentagon**
distributed by Schumacher.
- Picco**
distributed exclusively by Paris Racing Products.
- Pro-Line/Jaco**
P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968.
- Racers Edge**
4099 West 514 South, Kearns, UT 84118; (800) 622-7223.
- R/C Car Kings**
1913 W. Burnsville Pky., Burnsville, MN 55337; info line (952) 895-9643; orders (800) 707-5464; fax (952) 890-4185.
- RC Neon**
distributed by Varad, 17902 Star of India Ln., Carson, CA 90746; (310) 353-2612; fax (310) 768-3220.
- Reedy Modifieds/Team Associated**
3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342; fax (714) 850-1744.
- Rix Gear**
Rixgear@maxxtraxx.com.
- Robinson Racing Products**
4968 Meadow View Dr., Mariposa, CA 95338; (209) 966-2465; fax (209) 966-5937; www.robinsonracing.com.
- RockHoundz**
2150 South 3695 West, Unit 2, West Valley City, UT 84120.
- RPM Inc.**
14978 Sierra Bonita Ln., Chino, CA 91710; (909) 393-0366; fax (909) 393-0465.
- Schumacher USA**
6302 Benjamin Rd., Ste. 404, Tampa, FL 33634; (813) 889-9691; fax (813) 889-9593; www.racing-cars.com.
- Sonic-Tronics**
7865 Mill Rd., Elkins Park, PA 19027; (215) 635-6520; fax (215) 635-4951.
- Tamiya America Inc.**
2 Orion, Aliso Viejo, CA 92656-4200; (800) TAMIYA-A; fax (949) 362-2250; www.tamiya.com.
- Team Associated**
3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342; fax (714) 850-1744; www.teamassociated.com.
- Team Losi**
13848 Magnolia Ave., Chino, CA 91710; (909) 465-9728; fax (909) 590-1496; www.teamlosi.com.
- Traxxas Corp.**
12150 Shiloh Rd., #120, Dallas, TX 75228; (972) 613-3300; fax (972) 613-3599; www.traxxas.com.
- Trinity Products Inc.**
36 Meridian Rd., Edison, NJ 08820; (732) 635-1600; fax (732) 635-1640; www.teamtrinity.com.



Chris's BACK LOT

The opinions expressed on this page do not necessarily represent the opinions of the entire *Car Action* staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographs—anything you like—to Chris's Back Lot, c/o R/C Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. My email address is: chrisc@airage.com.

BY CHRIS CHIANELLI

RC Community Effort

Do good. Lend a hand

Consulting Psychologists Press Inc. (CPP) of Palo Alto, CA, has gotten together with Belle Haven Junior High School to sponsor a team of eighth graders for 1/10-scale racing under the "CPP Racing Team" name. The goal is for the students to benefit from working together and to build their self-confidence by successfully completing their TC-3 racecars and staging events as a group. As Kenneth Hawthorn, director of the program, states: "These kids are from a very tough area, and adding to their self-esteem as they enter high school is a heart-felt endeavor for me. This next school year, I am looking to incorporate the concept as an independent nonprofit undertaking and getting this program set up in other communities."

CPP has underwritten all the costs associated with the racing team, including cars, building materials and team attire. Personally, I've always felt that RC could work some good in this world in just the way CPP and Kenneth have done in California. I know this great RC car hobby has been very good to



Kenneth Hawthorn (rear) with the CPP Racing Team.



at kbh@cpp-db.com; or write (to his attention) to CPP, 3803 E. Bayshore Rd., P.O. Box 10096, Palo Alto, CA 94303.

The CCP Team already has a website: <http://currents.cpp-db.com/team>. I'm impressed! ■

many of you out there on the business end of the industry. I think that contacting Ken would be the right thing to do. Moreover, such action—and those who step up to the plate, as the expression goes—would be covered on the pages of *RC Car Action* for all the world to see.

To contact Ken Hawthorn, email him



Ivan

Ricardo

John

Andres

Jesus

Eliberto

